

SYLVA,

Or a DISCOURSE of

FOREST-TREES,

AND THE

PROPAGATION of TIMBER

In His MAJESTIES Dominions.

As it was Deliver'd in the *ROYAL SOCIETY* the xvth of October, MDCLXII. upon occasion of certain *Queries* propounded to that *Illustrious Assembly*, by the *Honourable* the Principal Officers, and Commissioners of the Navy.

TERRA,

A

Philosophical Essay of *EARTH*, being a *Lecture* in Course.

To which is annexed

POMONA:

OR, AN

Appendix concerning *Fruit-Trees* in relation to *CIDER*;
The *Making*, and several ways of *Ordering* it.

Published by express *Order* of the *ROYAL SOCIETY*.

ALSO

KALENDARIVM HORTENSE;

OR, THE

GARD'NERS ALMANAC;

Directing what he is to do *Monthly* throughout the Year.

All which several *Treatises* are in this *THIRD EDITION* much *Enlarged*, and *Improved*.
BY

JOHN EVELYN Esq; Fellow of the *ROYAL SOCIETY*.

—Tibis antiquae laudis & artis
ingredior, tantos anjos recludere fontes. Virg.

LONDON,

Printed for John Martyn, Printer to the *Royal Society*, and are to be sold at
the *Bell* in *St Paul's Church-Yard*. MDCLXXIX.

TO THE KING.

FOR to whom, Sir, with so just and equal right should I present the Fruits of my Labours, as to the Patron of that SOCIETY, under whose Influence, as it was produced; so to whose Auspices alone, it owes the favourable Acceptance, which it has receiv'd in the World? To You then (Royal Sir) does this Third Edition continue its humble Addresses, tanquam NE MORUM VINDICI, as of old, they paid their devotions HERCULI & SYLVANO; since You are our Deus ultor: Nemorensis Rex; as having once your Temple, and Court too, under that Sacred Oak, which You Consecrated with Your Presence, and we Celebrate, with just acknowledgment to God for Your Preservation.

Cato de R. R.
cap. 73.
Aurel. Vict.
Clas. Phil. 2.
pud. Tranquill.
And so Neme-
stinus, Deus
Nemorum,
Arnob. l. 4.

I need not Acquaint Your Majesty how many Millions of Timber-Trees (beside infinite others) have been Propagated, and Planted throughout Your vast Dominions, at the Instigation, and by the sole Direction of this Work; because Your Gracious Majesty, has been pleas'd to own it Publickly, for my Encouragement, who, in all that I here pretend to say, deliver only those Precepts which Your Majesty has put into practice; as having (like another Cyrus) by Your own Royal example, exceeded all Your Predecessors in the Plantations You have made, beyond (I dare assert it) all the Monarchs of this Nation, since the Conquest of it. And, indeed what more August, what more Worthy Your Majestie, or more becoming our Imitation? than whilst You are thus solicitous for the Publick good, we pursue Your Majesties great Example; and by Cultivating our decaying Woods, contribute to Your Power, as to our greatest Wealth and Safety; since whilst Your Majesty is furnish'd to send forth those Argo's, and Trojan Horses, about this happy Island, we are to fear nothing

Argon. lib. 1.
That famous
Ship built of
the Dodona's
Oak.

*

from

The Epistle Dedicatory.

from without it; and whilst we remain Obedient to Your just Commands, nothing from within it.

'Tis now some Years past, that Your Majesty was pleas'd to declare Your favourable Acceptance of a Treatise of Architecture, which I then presented to You, with many Gracious Expressions, and that it was a most useful piece. Sir, that Encouragement (together with the Success both of the Book it self, and of the former Editions of this) has animated me, still to continue my Oblation to Your Majesty of these Improvements: Nor was it certainly, without some Provident Conduct, that we have been thus solicitous to begin, as it were, with Materials for Building, and Directions to Builders; if due Reflection be made on that deplorable Calamity, the Conflagration of Your Imperial City; which nevertheless, by the Blessing of God, and Your Majesties gracious Influence, we have seen Rise again, a New, and much more Glorious PHOENIX.

This TRIBUTE, I now once more lay at the Feet of our ROYAL FOUNDER.

May Your Majesty be pleas'd, to be Invok'd by that no inglorious TITLE, in the profoundest Submissions of

Gracious Sir,

Your Majesties

ever Loyal, most Obedient and

Faithful Subject and Servant,

J. EVELYN.

Sayer Court
5 Dec. 1678.

TO THE R E A D E R.

AFTER what the Frontispiece and Porch of this Wooden Edifice presents you, I shall need no farther to repeat the Occasion of this following Discourse; I am only to acquaint you, That as it was delivered to the Royal Society by an unworthy Member thereof, in Obedience to their Commands; by the same it is now Re-publish'd without any farther Prospect: And the Reader is to know, That if these dry sticks afford him any Sap, it is one of the least and meanest of those Pieces which are every day produc'd by that Illustrious Assembly, and which enrich their Collections, as so many Monuments of their accurate Experiments, and Publick endeavours, in order to the production of real and useful Theories; the Propagation and Improvement of Natural Science, and the honour of their Institution. If to this there be any thing subjoyned here, which may a while bespeak the Patience of the Reader, it is only for the encouragement of an Industry, and worthy Labour, much in our dayes neglected, as haply reputed a Consideration of too fordid and vulgar a nature for Noble Persons, and Gentlemen to busie themselves withal, and who oftner find out occasions to Fell-down, and Destroy their Woods and Plantations, than either to repair or improve them.

But we are not without hopes of taking off these Prejudices, and of reconciling them to a Subject and an Industry which has been consecrated (as I may say) by as good, and as great Persons, as any the World has produced; and whose Names we find mingl'd amongst Kings and Philosophers, grave Senators, and Patriots of their Country: For such of old were Solomon, Cyrus, and Numa, Licinius surnamed Stolo, Cato, and Cincinnatus; the Piso's, Fabii, Cicero, the Phinies, and thousands more whom I might enume-

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enumerate, that disdain'd not to cultivate these Rusticities even with their own hands, and to esteem it no small Accession, to dignify their Titles, and adorn their purple with these Rural Characters of their affections to Planting, and love of this part of Agriculture, which has transmitted to us their venerable Names through so many Ages and Vicissitudes of the World.

That famous Answer alone which the Persian Monarch gave to Lyfander, will sufficiently justify that which I have laid; besides what we might add, out of the Writings and Examples of the rest: But since these may suffice after due reproofs of the late impolitique Waist, and universal sloth amongst us; we would now turn our Indignation into Prayers, and address our selves to our better natur'd Countrymen; that such Woods as do yet remain intire, might be carefully Preserved, and such as are Destroy'd, sedulously repaired: It is what all Persons who are Owners of Land may contribute to, and with infinite delight, as well as profit, who are touch'd with that laudable Ambition of imitating their Illustrious Ancestors, and of worthily serving their Generation. To these my earnest and humble Advice should be, That at their very first coming to their Estates, and as soon as they get Children, they would seriously think of this Work of Propagation also: For I observe there is no part of Husbandry, which men commonly more fail in, neglect, and have cause to repent of, than that they did not begin Planting betimes, without which, they can expect neither Fruit, Ornament, or Delight from their Labours: Men seldom Plant Trees till they begin to be Wise, that is, till they grow Old, and find by Experience the Prudence and Necessity of it.

My next Advice is, that they do not easily commit themselves to the Dictates of their ignorant Hinds and Servants, who are (generally speaking) more fit to Learn than to Instruct. Male agitur cum Domino quem Villicus docet, was an Observation of old Cato's; and 'twas Ischomachus who told Socrates (discoursing one day upon a like subject) That it was far easier to Make than to Find a good Husband-man: I have often prov'd it so in Gardeners; and I believe it will hold in most of our Country Employments:

See Petrarch de Remed. intellectus Introductione L. 1. Dial. 57.

Plin. & Colum. L. 7. Sec.

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ments: We are to exact Labour, not Conduct and Reason, from the greatest part of them; and the business of Planting is an Art or Science (for so Varro has solemnly defined it;) and that exceedingly wide of Truth, which (it seems) many in his time accounted of it; *fructum esse, nec ullius acuminis Rusticationem*, namely that it was an easie and insipid Study. It was the simple Culture only; with so much difficulty retriev'd from the late confusion of an intestine and boody War, like that of Ours, and now put in Reputation again, which made the noble Poet write,

How hard it was
Low Subjects with illustrious words to grace.

*Proba ex cinere magnum
Quam sit, & angustis tunc addere verbis honorem.*
Georg. 3.

Seeing, as the Orator does himself express it, *Nihil est haurire libero dignius*; there is nothing more becoming and worthy of a Gentleman. It was indeed a plain man (a Potter by Trade) but let no body despise him because a Potter (Agathocles, and a King was of that Craft) who in my Opinion has given us the true reason why Husbandry, and particularly Planting, is no more improv'd in this Age of ours: especially, where Persons are Lords and owners of much Land. The truth is, says he, when men have acquired any considerable Fortune by their good Husbandry, and experience (forgetting that the greatest Patriarchs, Princes, their Sons and Daughters, belonged to the Plough, and the Flock) they account it a shame to breed up their Children in the same Calling which they themselves were educated in, but presently design them Gentlemen: They must forsooth, have a Coat of Arms, and live upon their Estates; So as by the time his Sons Beard is grown, he begins to be ashamed of his Father, and would be ready to despise him, that should upon any occasion mind him of his honest Extraction: And if it chance that the good-man have other Children to provide for; This must be the Darling, be bred at School, and the University, whilst the rest must to Cart and Plow with the Father, &c. This is the Cause, says my Author, that our Lands are so ill Cultivated and neglected. Every body will subsist upon their own Revenue, and take their Pleasure, whilst they Resign their Estates to be manag'd by the

*In agris erant
tunc Senatores.*
Cic. de Senect.

*Palissy, le
Moyn de de-
venir Rich.*

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the most *Ignorant*, which are the *Children* whom they leave at home, or the *Hinds* to whom they commit them.) When as in *truth*, and in *reason*, the more *Learning*, the better *Philosophers*, and the greater *Abilities* they possess, the more, and the better are they qualified, to *Cultivate*, and improve their *Estates*: Methinks this is well and rationally argued.

And now you have in part what I had to produce in extenuation of this *Adventure*; that *Animated* with a *Command*, and *Assisted* by divers *Worthy Persons* (whose *Names* I am prone to *celebrate* with all just *Respects*) I have presumed to cast in my *Symbol*; which, with the rest that are to follow, may (I hope) be in some degree serviceable to him (who ere the happy *Person* be) that shall oblige the *World* with that compleat *Système* of *Agriculture*, which as yet seems a *desiderate*, and wanting to its full perfection. It is (I assure you) what is one of the *Principal Designs* of the *ROYAL SOCIETY*, not in this *Particular* only, but through all the *Liberal* and more useful *Arts*; and for which (in the estimation of all equal *Judges*) it will merit the greatest of *Encouragements*; that so, at last, what the Learned *Columella* has wittily reproached, and complained of, as a defect in that *Age* of his, concerning *Agriculture* in general, and is applicable *here*, may attain its desired *Remedy* and *Consummation* in *This* of *Ours*.

*Sola enim Res Rustica, quæ sine dubitatione proxima, & quasi consanguinea Sapientiæ est, tam discentibus eget, quam magistris: Adhuc in Scholis Rhetorum, & Geometrarum, Musi-
corumque, vel quod magis mirandum est, contemptissimorum vicio-
riorum officinas, gulosis condiendi cibos, & luxuriosius fercula
struendi, capitumque & capillorum concinatores, non solum esse
audivi, sed & ipse vidi; Agriculationis neque Doctores qui se
profiterentur, neque Discipulos cognovi.* But this I leave for our *Gallants* to Interpret, and should now apply my self to the *Directive* Part, which I am all this while bespeaking, if after what I have said in the several *Paragraphs* of the ensuing *Discourse* upon the *Argument* of *Wood*, (and which in this *Third Edition* coming *Abroad* with innumerable *Improvements*, and *Advantages* (so furnished, as I hope shall neither reproach the *Author*, or repent the *Reader*)

*Prefat. ad P.
Sylvium ;
which I ear-
nestly recom-
mend to the
serious peru-
sal of our
Gentry. Et
mihi ad sapien-
tis vitam prox-
imè videtur ac-
cedere. Cic. de
Senectute.*

it

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it might not seem superfluous to have *promised* any thing *here* for the *Encouragement* of so becoming an *Industry*. There are divers *Learned*, and judicious *Men* who have preceded Me in this *Argument*; as many, at least, as have undertaken to *Write* and *Compile* vast *Herbals*, and *Theaters* of *Plants*; of which we have some of our own *Countrymen*, who have (boldly I dare affirm it) surpass'd any, if not all the *Foreigners* that are extant: In *Those* it is you meet with the *Description* of the several *Plants*, by *Discourses*, *Figures*, *Names*, *Places* of *Growth*, time of *Flourishing*, and their *Medicinal Virtues*; which may supply any deficiency of mine as to those *Particulars*; if forbearing the *Repetition*, it should by any be imputed for a *defect*, though it were indeed none of my *design*: I say, these things are long since performed to our hands: But there is none of these (that I at least know of, and are come to my perusal) who have taken any considerable pains how to *Direct*, and *Encourage* us in the *Culture* of *Forest-Trees* (the grand defect of this *Nation*) besides some small sprinklings to be met withal in *Gervas Mark-
ham*, *Old Twiss*, and of *Foreigners*, the *Country-Earn* long since Translated out of *French*, and by no means suitable to our *clime* and *Country*: Neither have any of these proceeded after my *Method*, and so particularly, in *Raising*, *Planting*, *Dressing* and *Governing*, &c. or so sedulously made it their business, to specify the *Mechanical Uses* of the several kinds, as I have done, which was hitherto a great *desiderate*, and in which the *Reader* will likewise find some things altogether *New* and *Instructive*; and both *Directions* and *Encouragements* for the *Propagation* of some *Foreign* Curiosities of *Ornament* and *Use*, which were hitherto neglected. If I have upon occasion presumed to say any thing concerning their *Medicinal properties*, it has been *Modestly* and *Frugally*, and with chief, if not only respect to the poor *Wood-man*, whom none I presume will envy, that living far from the *Physician*, he should in case of *Necessity*, consult the reverend *Druid*, his * *Okaz*.

* No Sylve
quidem, hoc
villique na-
ture facies Medicinis caret, Sacra illa varietate rerum omnium, nusquam non remedia disponentis nobis, ut Medi-
cinas, siue etiam solitudo ipsa, &c. Hinc nota Medicinas, &c. Hæc sola ædium plerumque essentia parata con-
go, inventa facili, ac sine impendio, ex quibus viximus, &c. Plin. l. 24. c. 3.

and

To the Reader.

and his *Elm*, *Birch* or *Elder*, for a short *Breath*, a *Green Wound*, or a *fore Leg*; Casualties incident to this hard *Labour*. These are the chief *Particulars* of this ensuing *Work*, and what it pretends hitherto of *Singular*, in which let me be permitted to say, There is sufficient for *In-struction*, and more than is extant in any *Collection* whatsoever (*absit verbo invidia*) in this way and upon this *Subject*; abstracting things *Practicable*, of solid *use*, and *material*; from the *Ostentation* and impertinences of divers *Writers*; who receiving all that came to hand on *trust*, to swell their monstrous *Volumes*, have hitherto impos'd upon the credulous *World*, without *conscience* or *honesty*. I will not exasperate the *Adversers* of our ancient and late *Naturalists*, by repeating of what our *Verulam* has justly pronounced concerning their *Rhapsodies* (because I likewise honour their painful *Endeavours*, and am obliged to them for much of that I know,) nor will I (with some) reproach *Pliny*, *Porta*, *Cardan*, *Mizaldus*, *Cursius*, and many others of great *Names* (whose *Writings* I have diligently consulted) for the *Knowledge* they have imparted to me on this *Occasion*; but I must deplore the time which is (for the most part) so miserably lost in pursuit of their *Speculations*, where they treat upon this *Argument*: But the *World* is now advis'd, and (blessed be *God*) infinitely re- deem'd from that base and servile submission of our noblest *Faculties* to their blind *Traditions*. This, you will be apt to say, is a haughty *Period*; but whiles I affirm it of the *Past*, it *justifies*, and does *honour* to the *Present* Industry of our *Age*, and of which there cannot be a greater and more emulous *Instance*, than the *Passion* of His *Majesty* to encourage His *Subjects*, and of the *Royal Society*, (His *Majesties* *Foundation*) who receive and promote His *Dis- tates*, in all that is laudable and truly *emolumental* of this *Nature*.

It is not therefore that I here presume to instruct *Him* in the management of that great and august *Enterprise* of resolving to *Plant* and repair His ample *Forests*, and other *Magazines* of *Timber*, for the benefit of His *Royal Na- vy*, and the glory of His *Kingdoms*; but to present to His *Sacred Person*, and to the *World*, what *Advices* I have re- ceived

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ceived from others, observed my *self*, and most Industri- ously *Collected* from a studious propensity to serve as one of the least *Intelligences* in the ampler *Orb* of our *Illustri- ous Society*, and in a *Work* so Necessary and Important.

And now since I mention'd the *Society*, give me leave (worthy Reader) as a *Member* of that *Body*, which has been the chief *Promoter* of this ensuing *Work*, (and, as I stand oblig'd to vindicate that *Assembly*, and consequent- ly, the *Honour* of His *Majesty* and the *Nation*, in a *Parti- cular* which concerns it, though (in appearance) a little foreign to the present *Subject*.

I will not say that all which I have written in the se- veral *Paragraphs* of this *Treatise*, is *New*; but that there are very many *New*, and *useful* things, and *Observations* (with- out insisting on the *Method* only) not hitherto deliver'd by any *Author*, and so freely communicated, I hope will sufficiently appear: It is not therefore in behalf of any *Particular* which concerns my *self*, that I have been in- duced to enlarge this *Preface*; but, by taking this *Occasion*, to encounter the un-sufferable *Boldness*, or *Ambition* of some *Persons* (as well *Strangers*, as others) arrogating to themselves the being *Inventors* of divers *New*, and use- full *Experiments*, justly Attributable to several *Members* of the *Royal Society* *.

So far has that *Assembly* been from affecting *Glory*, that they seem rather to have declin'd their due; not as a- sham'd of so numerous, and fair an *Off-spring*; but as a- bundantly satisfied that after all the hard measure, and virulent *Reproaches* they had sustained, for endeavouring by united *Attempts*, and at their own *Charges*, to improve *Real Philosophy*; they had from time to time, cultivated that *Province* in so many *useful* and profitable *Instances*, as are already *Published* to the *World*, and will be easily *As- serted* to their *Authors* before all *Equitable Judges*.

This being the sole inducement of Publishing this *Apo- logy*; it may not perhaps seem unseasonable to *Disabuse* some (otherwise) well-meanning People, who led-away and perverted by the noise of a few *Ignorant*, and *Comical Bonifoons*; (whose *Malevolence*, or *Impertinences* intitle them to nothing that is truly *Great* and *Venerable*) are with an

Confute Hist. Roy. Soc and their Registers.

* The Laws of motion, and the Geometrical freightning of curve lines were first found out by Sir Christopher Wren and Mr. Thomas Digges.

The equated isocronous motion of the weight of a circular pendulum in a paraboloide, for the regulating of Clocks. And the improving pocket watches by springs applied to the balance, were first invented and demonstrated to this Society by Mr. Hooke.

I could mention the Barometer and several other useful inventions which as well as these have been injuriously arrogated by strangers though invented by English men and members of this Society, but 'tis not the business of this preface to enumerate all, though 'twas necessary to touch on some instances.

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Insolence suitable to their *Understanding*, still crying out, and asking, *What have the Society done?*

Now, as nothing less than *Miracles* (and unless *God* should every day repeat them at the call of these *Extravagants*) will convince some Persons, of the most *Rational* and *Divine Truths*, (already so often and extraordinarily established;) so, nor will any thing satisfy these *unreasonable Men*, but the production of the *Philosophers-stone*, and great *Elixir*; which yet were they *Possessors* of, they would consume upon their *Lux* and *Vanity*.

It is not therefore to gratify these *magnificent Fops*, whose *Talents* reach but to the adjusting of their *Peruques*, courting a *Mis*, or at the farthest writing a smutty, or scurrilous *Libel* (which they would have to pass for *genuine Wit*) that I concern my self in these *Papers*; but, as well in *Honour* of our *Royal Founder*, as the *Nation*, to *Assert* what of other *Countries* has been surreptitiously *Arrogated*, and by which, they not only *value themselves* abroad; but (prevailing on the modesty of that *Industrious Assemblée*) seek the *deference* of those, who whilst it remains still silent, do not so clearly discern this glorious *Plumage* to be purely *Ascension*, and not a *Feather* of their own. —But still, *What have they done?*

Those who perfectly comprehend the *Scope*, and *End* of that noble *Institution*; which is to *Improve Natural Knowledge*, and enlarge the *Empire* of *Operative Philosophy*; not by an *Abolition* of the *Old*, but by the *Real Effects* of the *Experimental*; *Collecting*, *Examining*, and *Improving* their scatter'd *Phenomena's*, to establish even the *Received Methods* and *Principles* of the *Schools* (as far as were consistent with *Truth*, and matter of *Fact*) thought it long enough, that the *World* had been impos'd upon by that *Notional*, and *Formal* way of delivering divers *Systèmes* and *Bodies* of *Philosophy* (falsely so call'd) beyond which there was no more *Country* to discover; which being brought to the *Test* and *Trial*, vapours all away in *Fume*, and empty *Sound*.

This *Structure* then being thus *Ruinous* and *Crazy*; 'tis obvious what they were to do; even the same which skillful *Architects* do every day before us; by pulling down the

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the decay'd, and sinking wall to erect a better, and more substantial in its place: They not only take down the old, reject the useless and decay'd; but sever such *Materials* as are solid, and will serve again; bring new-ones in, prepare and frame a *Model* suitable to so magnificent a design: This *Solomon* did in order to the *Building* of the *Material Temple*; and this is here to be pursued in the *Intellectual*: Nay here was abundance of *Rubbish* to be clear'd, that the *Area* might be free; and then was the *Foundation* to be deeply searched, the *Materials* accurately *Examined*, *Squar'd*, and *Adjusted* before it could be laid: Nor was this the labour of a *Few*; less than a much longer time, more cost, and encouragement than any which the *Society* has yet met withal, could in reason be sufficient effectually to go through so chargeable a *Work*, and highly necessary.

A long time it was they had been surveying the *Decays*, of what was ready now to drop in pieces, whatever shew the outside made with a noise of *Elements*, and *Qualities*, *Occult* and *Evident*; abhorrence of *Vacuum*, *Sympathies*, *Antipathies*; *Substantial forms*, and *Prime-matter* courting *Form*; *Epicyles*, *Ptolomean Hypotheses*, magisterial *Definitions*, peremptory *Maximes*, *Speculative*, and *Positive* doctrines and *dissonant Phrases*, with a thousand other *Precarious* and unintelligible *Notions*, &c. all which they have been turning over, to see if they could find any thing of *sincere* and *useful* among this *Pedantick Rubbish*, but all in *vain*; here was nothing *material*, nothing of moment *Mathematical*, or *Mechanical*, and which had not been miserably *Sophisticated*, on which to lay the stress; nothing in a manner whereby any farther *Progress* could be made, for the raising and *Emnobling* the *Dignity* of *Mankind* in the *Sublimest* operations of the *Rational Faculty*, by clearing the *Obscurities*, and healing the *Defects* of most of the *Physiological Hypotheses*, repugnant, as they hitherto seem'd to be, to the *Principles* of real *Knowledge* and *Experience*.

Now although it neither were their *Hopes*, or in their prospect to (*consummate* a design requiring so mighty aids) in-virion'd as they have been with these prejudices) yet have they not at all desisted from the *enterprise*; but rather than so Noble and *Illustrious* an *undertaking* should not proceed

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ceed for want of some generous and industrious Spirits to promote the *Work*; they have themselves submitted to those mean employments, of digging in the very *Quarry*; yea even of making *Brick* where there was no *Straw*, but what they gleaned, and lay dispersed up and down: Nor did they think their pains yet ill-bestow'd; if through the assiduous labour, and a train of continual Experiments, they might at last furnish and leave solid, and uncorrupt materials to a succeeding, and more grateful Age, for the building up a Body of real, and substantial Philosophy, which should never succumb to time, but with the ruins of Nature and the World it self.

In order to this, how many, and almost innumerable have been their Tryals, and Experiments through the large, and ample field both of Art and Nature? We call our Journals, Registers, Correspondence, and Transactions to witness; and may with modesty provoke all our Systematical Methodists, Natural Histories and Pretenders hitherto extant from the beginning of letters, to this period; to shew us so ample, so worthy and so useful a Collection. 'Tis a Fatality and an injury to be deplored, that those who give us hard-words, will not first vouchsafe impartially to examine these particulars; since all Ingenious Spirits could not but be abundantly satisfied, that this Illustrious Assembly has not met so many Years purely for Speculation only; though I take even that to be no ignoble Culture of the Mind, or time mispent for Persons who have so few Friends, and slender obligations, to those who should Patronize and Encourage them: But they have aimed at greater things, and greater things produc'd: namely, by Emancipating, and freeing themselves from the Tyranny of Opinion, delusory and fallacious shews, to receive nothing upon Trust, but bring it to the Lydian touch, make it pass the Fire, the Anvil and the File, till it come forth perfectly repurged, and of consistence. They are not hasty in concluding from a single, or incompetent number of Experiments, to pronounce the Ecstatic Hecatica, and offer Hecatombs; But, after the most diligent Scrutiny, and by degrees, and wary Inductions honestly and faithfully made; to Record the Truth, and event of Tryals, and transmit them to Posterity. They

resort

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resort not immediately to general Propositions, upon every specious appearance; but stay for light, and Information from Particulars, and make Report de Facto, and as sense informs them. They reject no Sect of Philosophers, no Mechanic helps, except no Persons of Men; but cherefully embracing all, cull out of all, and alone retain what abides the Test; that from a plentiful, and well-furnish'd Magazine of true Experiments, they may in time, advance to solemn, and established Axiomes, General Rules and Maximes, and a Structure may indeed lift up its head, such as may stand the shock of Time, and render a solid accompt of the Phenomena, and Effects of Nature, the Aspectable Works of God, and their Combinations; so as by Causes and Effects, certain and useful consequences may be deduced. Therefore they do not fill their Papers with Transcripts out of Rhapsodists, Mountebanks and Compilers of Receipts and Secrets to the loss of oyl and labour; but as it were, evaporating nature, disclosing the resorts, and springs of Motion have collected innumerable Experiments, Histories and Discourses; and brought in Specimens for the Improvement of Astronomy, Geography, Navigation, Optics; All the parts of Agriculture, the Garden and the Forest; Anatomy of Plants, Mines and Ores; Measures and Equations of Time by accurate Pendules, and other motions, Hydro-, and Hygrostatics, divers Engines, Powers and Automata, with innumerable more Luciferous particulars, subservient to humane life, of which the most obliging Dr. Granvil has given an ample, and ingenious Accompt in his learned Essay.

This is (Reader) what they have done; and they are but part of the Materials which the Society have hitherto amassed, and prepared for this great, and Illustrious Work; not to pass-over an infinity of solitary, and loose Experiments subsidiary to it, gathered at no small pains and cost: For so have they hitherto born the Burden and heat of the day alone; Saping and Mining to lay the Foundation deep, and raise a superstructure to be one day perfected, by the joint endeavours of those who shall in a kinder Age, have little else to do, but the putting and cementing of the parts together, which to Collect and fit, have cost them so much solicitude and care. Solomon indeed built the glorious

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ous Temple; but 'twas David provided the Materials: Did Men in those days, insolently ask *What he had done*, in all the time of that tedious preparation? I beseech you what *Obligation* has the R. Society to render an *Account* of their proceedings to any who are not of the Body, and that carry on the *Work* at their own *expense* amidst so many contradictions? It is an *Evil Spirit*, and an *Evil Age*, which having sadly *debauch'd* the minds of Men; seeks with industry to blast and undermine all attempts, and endeavours that signify to the illustration of *Truth*, the discovery of *Impostors*, and shake their sandy foundations.

Neh. 2. 19.

Those who come (says the noble *Verulam*) to enquire after knowledge, with a mind to scorn, shall be sure to find matter for their humor; but none for their instruction: would Men bring light of Invention, and not fire-brands of Contradiction, knowledge would infinitely increase. But these are the *Sanballats* and *Horvites* who disturb our Men upon the wall: But, let us rise up and build, and be no more discourag'd. 'Tis impossible to conceive, how so honest, and worthy a design should have found so few *Promoters*, and cold a welcome in a Nation whose eyes are so wide open: We see how greedily the *French*, and other *Strangers* embrace and cultivate the design: what sumptuous *Buildings*, well furnish'd *Observatories*, ample *Appointments*, *Salaries*, and *Accommodations* they have erected to carry on the *Work*; whilst we live *Precariously*, and spin the *Web* out of our own *bowels*. Indeed we have had the honour to be the first who led the way, given the *Ferment*, which like a train has taken *Fire*, and warm'd the *Regions* all about us. *This Glory* doubtless, shall none take from us: But whilst they flourish so abroad, we want the *Spirit* should diffuse it here at home, and give progress to so hopeful a beginning: But as we said, the *Enemy of Mankind* has done us this despite; It is his interest to impeach (in any sort) what e're opposes his *Dominion*; which is to lead, and settle Men in *Errors* as well in *Arts*, and *Natural Knowledge*, as in *Religion*; and therefore would be glad, the World should still be groping after both. 'Tis he that sets the *Bouffooners*, and empty *Sycophants*, to turn all that's *Great* and *Virtuous* into *Raillery* and derision: 'Tis therefore to encounter these,

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these, that like those resolute *Builders* whilst we employ one hand in the work, we, with the other are oblig'd to hold our *Weapon*, 'till some bold, and *Gallant genius* deliver us, and raise the *Siege*. How gloriously would such a *Benefactor* shine! What a *Constellation* would he make! how great a *Name* establish! For mine own part (*Religiously* I profess it) were I not a *Person*, who (whilst I stood expecting when others more worthy, and able than my self, should have snatch'd the opportunity of signaling a work worthy of *Immortality*) had long since given *Hostages* to *Fortune*, and so put my self out of capacity of shewing my *Affection* to a design so glorious; I would not only most cherefully have contributed towards the freeing it from the straits it so long has struggl'd under; but Sacrific'd all my *Secular Interests* in their service: But, as I said, this is reserv'd for that *Gallant Hero* (who e're he be) that truly weighing the noble and universal *Consequence* of so high an *Enterprize*; shall at last free it of these *reproaches*; and either set it above the reach of *Envy*, or convert it to *Emulation*. This were indeed to consult an honest *Fame*, and to *Embalm* the *Memory* of a *Greater Name* than any has yet appear'd amongst all the *Benefactors* of the *Disputing Sects*: Let it suffice to affirm, that next the *Propagation* of our most *Holy Faith*, and its *Appendants*, nor can His Majesty or the *Nation* build their *Fame* on a more lasting, a more *Glorious Monument*; The propagation of *Learning*, and *useful Arts*, having always surviv'd the *Triumphs* of the proudest *Conquerors*, and spillers of humane blood; *Princes* have been more *Renown'd* for their *Civility* to *Arts* and *Letters*, than to all their *Sanguine Victories*, subduing *Provinces*, and making those brutish desolations in the World, to feed a salvage, and vile *Ambition*. Witness you *Great Alexander*, and you the *Ptolomies*, *Cesars*, *Charlemain*, *Francis* the First; the *Cosmas*, *Fredrics*, *Alphonsus's*, and the rest of *Learned Princes*, since when all the *Pomp* and noise is ended; They are those little things in black, (whom now in scorn they term *Philosophers*, and *Fopps*) to whom they must be oblig'd, for making their *Names* out-last the *Pyramids* whose *Founders* are as unknown, as the heads of *Nile*; because they

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they either deserv'd no *Memory* for their *Vertues*; or had none to transmit them, or their *Actions* to *Posterity*.

Is not our *R. Founder* already Panegyris'd by all the *Universities*, *Academists*, *Learned Persons*, divers *Princes Ambassadors* and *Illustrious Men* from abroad? Witness besides, the many accurate *Treatises* and *Volumes* of the most curious, and useful Subjects, *Medicinal*, *Mathematical*, and *Mechanical* dedicated to His Majesty as *Founder*; to its *President*, and to the *Society* by the greatest *Wits*, and most profoundly knowing of the *European World*, celebrating their *Institution* and *Proceedings*: Witness, the daily submissions and solemn *Appeals* of the most learned *Strangers* to its *suffrages*, as to the most able, candid and impartial *Judges*: Witness, the *Letters*, and *Correspondencies* from most parts of the *habitable Earth*, *East*, and *West-Indies*, and almost from *Pole to Pole*; besides what they have receiv'd from the very Mouthes of divers *Professors*, *Publique Ministers*, great *Travellers*, *Noblemen*, and *Persons* of highest quality; who have not only frequented the *Assembly*, but desir'd to be *Incorporated* and *Ascrib'd* into their *Number*; so little has His Majesty, or the *Kingdom* been diminish'd in their reputation, by the *Royal Society*, to the reproach of our sordid *Adversaries*: Never had the *Republique* of *Letters* so learned and universal a *Correspondence* as has been procur'd and promoted by this *Society* alone; as not only the casual *Transactions* of several years (filled with *Instances* of the most curious, and useful *Observations*) make appear; but (as I said) the many *Nuncupatory Epistles* to be seen in the fronts of so many learned *Volumes*: There it is you will find *CHARLES* the II. plac'd among the *Heroes* and *Demi-Gods*, for his *Patrocity* and *Protection*; There you will see the numerous *Congratulations* of the most learned *Foreigners*, celebrating the happiness of their *Institution*; and that whilst other *Nations* are still benighted under the dusky *Cloud*, such a refulgent beam should give day to this blessed *Isle*; And certainly, it is not to be supposed that all these *Learned Persons*, of so many, and divers *Interests*, as well as *Countries*, should speak, and write thus out of *Flattery*, much less of *Ignorance*; being Men the most refin'd, of *Universal Knowledge*,

To the Reader.

ledge, as well as *Ingeniuty*: But I should never end, were I to pursue this fruitful *Topic*. I have but one word more to add, to conciliate the *Favour*, and esteem of our own *Universities*, to an *Assembly* of *Gentlemen*, who from them acknowledge to have deriv'd all their *Abilities* for these laudable undertakings; and what above all, is most shining in them of most *Christian*, *Moral* and otherwise conspicuous, as from the *Source* and *Fountain* to which on all occasions, they are not only ready to pay the *Tribute* and *Obsequiousness* of humble *Servants*, but of *Sons*, and dutiful *Alumni*. There is nothing verily which they more desire, than a fair and mutual *Correspondence* between so near *Relations*, and that they may perpetually be *Flourishing* and *Fruitful* in bringing forth (as still they do) supplies to *Church* and *State* in all its great capacities: Finally, that they would regard the *Royal Society* as a *Colony* of their own *Plantings*, and *Augure* it *success*. And if in these *Labours*, and arduous attempts, several *Inventions* of present use and service to *Mankind* (either detecting *Errors*, illustrating, and asserting *Truths*; or propagating knowledge in *Natural-things*, and the visible *works* of *God*) have been discover'd; as they envy not the *Communicating* them to the *World*; so should they be wanting to the *Society*, and to the *Honour* of divers *Learned*, and *Ingenious Persons* (who are the *Soul* and *Body* of it) not to vindicate them from the ambitious *Plagiary*, the insults of *Scoffers* and injurious men: Certainly persons of right *Noble* and subactd *Principles*, that were *Lovers* of their *Country*, should be otherwise affected; and rather strive to encourage, and promote, endeavours tending to so generous a design, than decry it; especially, when it costs them nothing but their *Civility* to so many obliging persons, though they should hitherto have entertain'd them but with some innocent *Diversions*. To conclude, we envy none their *dues*; nay we gratefully acknowledge any *light* which we receive either from *Home* or from *Abroad*: We *Celebrate*, and *Record* their *Names* amongst our *Benefactors*; recommend them to the *publique*, and what we thus freely give, we hope as freely to receive.

Thus have I endeavour'd to vindicate the *Royal Society*
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from some *Aspersions* and *Inocuments* it hitherto has suffer'd; and shew'd under what *weights* and *pressure* this *Palme* does still emerge; And if for all this I fall *short* of my attempt; I shall yet have this *satisfaction*; That though I derive no *Glory* from my own *Abilities* (sensible of my great *Defects*) I shall yet *deserve* their *pardon* for my *zeal* to its *Prosperity*.

Epictetus, &c.

Φιλοσοφίας ἐπιθυμίας; μαρτυροῦντι δὲ αὐτῶν &c.

Desirest thou to be a *Philosopher*? Prepare thy self for *Scoffs*: What, you are setting up for a *Virtuoso* now? Why so proud I pray? Well, be not thou proud for all this; But so keep thee to what shall seem *best* and *laudable*, as if God himself had plac'd thee there; and remember, that so long as thou shalt remain in that *State*, and *resolution*, thy *Reproachers* will in time, *admire* thee; But, if once through *Inconstancy* thou *give-out* and *flinch*, διὰ τὴν ἀμεταμέλητον ἀναισθησίαν, Thou *deservest* to be doubly *laught* at.

Lord Verulam, Instaur. Scient.

Some Men (like *Lucian* in *Religion*) seek by their *Wit*, to *Traduce*, and *Expose* *useful* things; because to arrive at them, they converse with mean *Experiments*: But those who *despise* to be employ'd in ordinary and common matters, never arrive to solid perfection in *Experimental Knowledge*.

J. Evelyn.

ADVER-

ADVERTISEMENT.

As I did not altogether compile this *Work* for the sake of our Ordinary *Rustics*, but for the more *Ingenious*; the benefit and diversion of *Gentlemen*, and Persons of *Quality*, who often refresh themselves in these agreeable *Toiles* of *Planting*, and the *Gardens*: I may perhaps in some places, have made use of (here and there) a *Word* not as yet so familiar to every *Reader*; but none that I know of, which are not sufficiently explained by the *Context* and *Discourse*. That this may yet be no *prejudice* to the *meaner capacities* let them *Read* for

Ablaqueation, laying bare the *Roots*.

Amputation, cutting quite off.

Arborator, *Pruner*, or one that has care of the *Trees*.

Avenue, the principal *Walk* to the *Front* of the *House* or *Seat*.

Bulbs, round or *Onion-shap'd* roots.

Calcine, burn to ashes.

Compost, *Dung*.

Conservatory, green-house to keep choice *Plants*, &c. in.

Contr'espaliere, a *Palisade* or *Pole-bedge*.

Coronary Garden, *Flower-Garden*.

Culinarie, belonging to the *Kitchen*, *Roots*, *Salading*, &c.

Culture, dressing.

Decorticate, to strip off the *Bark*.

Emuscation, cleansing it of the *Moss*.

Esculent, *Roots*, *Salads*, &c. fit to eat.

Espalieres, *Wall-fruit-trees*.

Exotics, outlandish, rare and choice.

Fermentation, *Working*.

Fibrous, stringy.

Fronsdation, stripping off *Leaves*, and *Boughs*.

Heterogeneous, repugnant.

Homogeneous, agreeable.

Hyemation, protection in *Winter*.

Ichnographie, *Ground-plot*.

Inoculation, budding.

Infusion,

Inſition, Graſſing.
Inſolation, expoſing to the Sun.
Interlucation, thinning and diſbranching of a Wood.
Irrigation, Watering.
Laboratorie, Still-houſe.
Letation, Dung.
Lixivium, Lee.
Mural, belonging to the wall.
Oltorie, *Salads*, &c. belonging to the *Kitchen-Garden*.
Palifade, Pole-hedge.
Parterre, Flower-Garden, or *Knots*.
Perennial, continuing all the year.
Quincunx, Trees ſet like the *Cinque-point* of a Die.
Rectiſie, re-diſtill.
Seminarie, Nurſerie.
Stercoration, Dunging.
S. S. S. Stratum ſuper Stratum, one bed, or layer upon another.
Tanſie, that which may be ſhorn, or clip'd.
Topiary-works, the clipping, cutting and forming of hedges, &c. into figures and works.
Vernal, belonging to the Spring, &c. The reſt are *Obvious*.

BOOKS Publiſh'd by the Author of this Diſcourſe.

1. The French Gard'ner, III. Edition: Twelve, with Mr. Roſe's Vineyard.
2. Fumi fugium, or a Prophetic Inveſtive againſt the Smoke of London: Quarto.
3. Sylva, or a Diſcourſe of Foreſt-Trees, &c. the III. Edition, very much Improv'd: Fol.
4. Kalendarium Hortenſe, both in Folio and Octavo, the V. Edition, much Augmented.
5. Sculptura, or the Hiſtory of Chalcography and Engraving in Copper, the Original and Progreſs of that Art, &c. Octavo.
6. The Parallel of Architecture, being an Account of Ten famous Architects, with a Diſcourſe of the Terms, and a Treatiſe of Statues: Folio.
7. The Idea of the Perfection of Painting: Octavo.
8. Navigation, and Commerce, their Original, and Progreſs: Octavo.
9. Terra, or a Philoſophical diſcourſe of Earth, II. Edition: Folio and Octavo.

Amico

Amico chariſſimo *Jobanni Evelyno Armigero*,
 è Societate Regali Londini. J. Beale, S. P. D.
 In Sylvam.

Are age quid cauſe eſt quod tu Sylveſtria pangis,
 Inter Sylvanos, capripedesque Deos?
 Inter Hamadryadas letus, Dryadasque pudicas,
 Cum tua Cyrrhaes ſit Chelys apta modis!
 Scilicet hoc cecinit numerofus Horatius olim,
 Scriptorum Sylvam quod Chorus Omnis amat.
 Eſt locus ille Sacer Muſis, & Apolline dignus,
 Prima dedit Summo Templum Sacrandum Jovi.
 Hinc quoque nunc Pontem Pontus non reſpuit ingens,
 Stringitur Oceanus, corripiturque Salum.
 Hinc novus Helſperii emenſit mundus in oris,
 Effuditque auri flumina larga probi.
 Hinc exundavit diſtento Copia cornu,
 Qualem & Amalthææ non habuere ſinus.
 Sylva tibi curæ eſt, grata & Pomona refundit
 Auriferum, roſeum, purpureumque nemus.
 Illa famemque ſitimque abigens expirat odores,
 Quales nec Medus, nec tibi mittit Arabs.
 Ambroſiam præbent modo cocta Cydonia, Tantum
 Comprime, Neſtæreo poma liquore fluunt.
 Progredere, O Sæcli Cultor memorande futuri,
 Felix Horticolam ſic imitare Deum.

Gen. 1. 6. 2.

Nobilissimo Viro *Jobanni Evelyno* Regalis
Soc. Socio dignissimo.

AUus laudato qui quondam reddere versu,
Eternum & tentare melos, conamine magno
Lucreti nomenque suum donaverat ævo:
Ille leves atomos audaci pangere musa
Aggreditur, variis & semina cæca figuris,
Naturæque vias: non quæ Schola garrula jactat,
Non quæ rixanti fert barbara turba Lyceo:
Ingentes animi sensus, & pondera rerum,
Grandior expressit Genius, nec scripta minora
Ev'linum decuisse solent.

Tuque per obscuro (victor Boylæ) recessus,
Naturæ meditaris opus, qua luce colores
Percipimus, quali magnus ferit organa motu
Cartesius, quali volitant primordia plexu
Ex atomis, Gassende, tuis; simulachraque rerum
Diffugiunt tacito vastum per inane meatu:
Mutato varios mentitur lana colores
Lumine; dum tales ardens habet ipsa figuras
Purpura, Sidonioque aliæ tinxere veneno:
Materiam assiduo variatam, ut Protea, motu
Concipis, hinc formæ patuit nascentis origo,
Hinc hominum species, & vasti machina cæli:
Ipse creare Deus, solusque ostendere mundum
Boylæus potuit, sed nunc favet æmula virtus,
(Magne Eveline) tibi, & generosos excitat ignes:
Perge Scipiada duo, qui vel mille Marones
Obruistis, longo & meriti lassatis honore.

Tu vero dilecte nimis! qui stemmate ab alto
Patricios deducis avos, cerasque parentum
Wottonicæ de stirpe domus; virtutibus æquas
Nunc generis monumenta tui, post tadia Ponti

Libro de coloribus.

De origines formationis.

peritiam in agro Surrey.

Innu-

Innumerasque errore vias, quid Sequana fallax,
Hostilis quæ Rhenus agit, quæ Tibris, & Ister,
Nota tibi: triplici quid perfida Roma corona
Gessit, & Adriaca Venetus deliberat arce,
Qualiaque Odrysias vexarunt prælia limas.
Hic qui naturæ interpres & sedulus artis
Cultor, qui mores hominum cognovit, & urbes:
Dum Pincus comes ire parat, mentemque capacem
Vidit uerque polus, nec Grajum cana vetustas
Hinc latui, veterum nunc præca numismata regum
Erui, & Latias per mystica templa ruinas:
Æstimat ille Forum, & vasti fundamenta Circi,
Cumque ruinoso Capitolia præca Theatro,
Et Dominos colles atque palatia Romæ:
Regales notat inde domos, ut mole superba
Surgat apex, molles quæ testæ imitantur Ionas,
Qualia Romulea, Gothica quæ marmora dextra,
Quicquid Tusceus habet, mira panduntur ab arte.
O fame patriæque facer! vel diruta chartis
Vivet Roma tuis; te vindice, leta Corinthus
Stabit adhuc, magno nequicquam invisa Metello.

Nunc quoque Ruris opes dulcesque ante omnia curas
Pandis ovans, tristes maneat quæ cura Decembres,
Pleiades hæc Hyadesque jubent, hæc leta Bootes
Semina mandat humi, ardenti hæc Sirius agro,
Capit ut æstiva segetes terrere favilla,
Hoc Maij vernantis opus, dum florea sorta
Invitant Dominas ruris, dum cævere repenti
Ridet ager, renovatque suos Narcissus amores.

Haud aliter victrix divinam Æneida vates
Lusit opus, simul & gracili modulatus avena,
Fata docent majora tuos Eveline, triumphos,
Æternum renovatur bonos, te nulla vetustas
Obruat, atque tua servanda volumina cedro
Durent, & meritam cingat tibi laurea frontem
Qui vitam Sylvis donasti & Floribus ævum.

Consule librum
Antoris de æt.
Chitellana.

R. Bohan.

ΕΙΣ ΤΗΝ ΤΟΥ ΠΑΤΡΟΣ ΔΕΝΔΡΟΛΟΓΙΑΝ.

Υ Μνήσω φρονίμιο πάτερ μελέεσσι ἐπαύης,
 Ὑμνήσω ὅπτεσσιν ἀεικύνοντα γεραιών·
 Ὅσεσιν πανακτὶς ἀρετὴν δρυὸς αὐτὸς ἔγραψεν,
 Καὶ ποταπῶν γενεὴν δένδρων ἕλ' ὀλίκοις ὕλην·
 Ἀθανάτων κώδιτ'· ἦ νηφελιγχεῖτα Ζεὺς,
 Ἐχεν δὴ δένδρῳ φίλους περιπίδουσι ἑλδιδι,
 Φύλλοις τ' ἀμβροσίῳ δαλαρεῶς δρυὸς ἐσφάνατο·
 Ἀγλιακῶν ὅς ἄριστ'· ἦν Ἰσοκέλι' ἀήρ,
 Ἰσοκὴν δένδρῳ τίλεσσι φρέσι κυδαλίμῳσι,
 Ὑλογενὲς, κυπερὸς, ἡμέροισι, ὅς μέγ' ὄνειαρ
 Ἀνδρείσιν ἐστυρμόσι χ' γάμῳ πελοδότεσαν,
 Νηυσὶ τε ποντοπύργοι βαρυδύπτο δαλάροισι.

Jo. Evelyn, Jun.

THE GARDEN.

To J. Evelyn Esquire.

I Never had any other desire so strong, and so like to Covetousness as that one which I have had always that I might be Master at last of a small house and large Garden, with very moderate conveniences joyned to them, and there dedicate the remainder of my life only to the culture of them, and study of Nature,

And there (with no design beyond my wall) whole and entire to lye,
 In no unactive Ease, and no unglorious Poverty.

Or as *Virgil* has said, Shorter and Better for me, that I might there *studius foreveignabilis otii* (though I could wish that he had rather said, *Nobilis otii*, when he spoke of his own) but several accidents of my ill fortune have disappointed me hitherto, and do still of that felicity; for though I have made the first and hardest step to it, by abandoning all ambitions and hopes in this World, and by retiring from the noise of all business and almost company, yet I stick still in the Inn of a hired House and Garden, among Weeds and Rubbish; and without that pleasantest work of Humane Industry, the Improvement of something which we call (not very properly, but yet we call) our Own. I am gone out from *Sodom*, but I am not yet arrived at my little *Zoar*. *O let me escape thither, (is it not a little one?) and my soul shall live*. I do not look back yet; but I have been forced to stop, and make too many halts. You may wonder, Sir, (for this seems a little too extravagant and Pindarical for *Prose*) what I mean by all this Preface; It is to let you know, That though I have mist, like a Chymist, my great End, yet I account my affections and endeavours well rewarded by something that I have met with by the By; which is, that they have procured to me some part in your kindness and esteem; and thereby the honour of having my Name so advantageously recommended to Posterity, by the *Epistle* you are pleased to prefix to the most useful Book that has been written in that kind, and which is to last as long as Months and Years.

Among many other *Arts* and *Excellencies* which you enjoy, I am glad to find this Favourite of mine the most predominant, That you choose this for your Wife, though you have hundreds of other Arts for your Concubines; though you know them, and

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beget Sons upon them all (to which you are rich enough to allow great Legacies) yet the issue of this seems to be designed by you to the main of the Estate; you have taken most pleasure in it, and bestow'd most charges upon its Education: and I doubt not to see that Book, which you are pleas'd to promise to the World, and of which you have given us a large earnest in your Calendar, as accomplish'd, as any thing can be expected from an *Extraordinary Application*, and no ordinary Expences, and a long Experience. I know no body that possesses more private happiness than you do in your Garden; and yet no man who makes his happiness more publick, by a free communication of the Art and Knowledge of it to others. All that I my self am able yet to do, is only to recommend to Mankind the search of that Felicity, which you instruct them how to Find and to Enjoy.

1.
Happy art thou whom God does bless
With the full choice of thine own Happiness;
And happier yet, because thou'rt blest
With prudence how to choose the best:
In Books and Gardens thou hast plac'd aright
(Things well which thou dost understand,
And both dost make with thy laborious hand)
Thy noble innocent delight:
And in thy virtuous Wife, where thou again dost meet
Both pleasures more refin'd and sweet:
The fairest Garden in her Looks,
And in her Mind the wisest Books.
Oh, Who would change these soft, yet solid joys,
For empty shows and fenceless noise;
And all which rank Ambition breeds,
Which seem such beauteous Flowers, and are such poisonous Weeds?

2.
When God did Man to his own Likeness make,
As much as Clay, though of the purest kind,
By the great Potters art refin'd,
Could the Divine Impression take:
He thought it fit to place him, where
A kind of Heav'n too did appear,
As far as Earth could such a likeness bear:
That man no happiness might want,
Which Earth to her first Master could afford;
He did a Garden for him plant
By the quick hand of his Omnipotent Word.
As the chief Help and Joy of Humane Life,
He gave him the first Gift; first, even before a Wife.

For

3.
For God, the universal Architect,
'T had been as easie to erect
A Louvre, or Elysium, or a Tower
That might with Heav'n communication hold,
As *Babel* vainly thought to do of old:
He wanted not the skill or power,
In the World's Fabrick those were shown,
And the Materials were all his own.
But well he knew what place would best agree
With Innocence, and with Felicitie:
And we'd few here still look for them in vain,
If any part of either yet remain;
If any part of either we expect,
This may our judgement in the search direct;
God the first Garden made, and the first City, *Cain*.

4.
O blessed shades! O gentle cool retreat
From all th' immoderate Heat;
In which the frantick World does burn and sweat!
This does the Lion Star, Ambitions rage;
This Avarice, the Dog-Stars Thirst assuage;
Every where else their fatal power we see,
They make and rule Mans wretched Destinie:
They neither Set, nor disappear,
But tyrannize o'r all the Year;
Whil't we ne'r feel their Flame or Influence here.
The Birds that dance from bough to bough,
And sing above in every Tree,
Are not from Fears and Cares more free,
Than we who Lie, or Walk below,
And should by right be Singers too.
What Princes Quire of Musick can excell
That which within this shade does dwell?
To which we nothing Pay or Give,
They like all other Poets live,
Without reward, or thanks for their obliging pains;
'Tis well if they become not Prey:
The whistling winds add their less artful strains,
And a grave Base the murmuring Fountains play;
Nature does all this Harmony bestow,
But to our Plants, Arts Musick too,
The Pipe, Theorbo, and Guitar we owe;
The Lute it self, which once was Green and Mute,
When *Orpheus* struck th' inspired Lute,
The Trees danc'd round, and understood
By Sympathy the voice of wood.

These

5.
 These are the Spells that to kind Sleep invite,
 And nothing does within resistance make,
 Which yet we moderately take;
 Who would not choofe to be awake,
 While he's incompas'd round with such delight,
 To th' Ear, the Nose, the Touch, the Taste, and Sight?
 When *Venus* would her dear *Ascanius* keep
 A Prisoner in the Downy Bands of Sleep,
 She Od'rous Herbs and Flowers beneath him spread
 As the most soft and sweetest Bed;
 Not her own Lap, would more have charm'd his Head.
 Who, that has Reason, and his Smell,
 Would not among Roses and Jasmin dwell,
 Rather than all his Spirits choak
 With exhalations of Dirt and Smoak?
 And all th' uncleanness which does drown
 In pestilential Clouds a populous Town?
 The Earth it self breathes better Perfumes here,
 Than all the Female Men or Women there,
 Not without cause about them bear.

6.
 When *Epicurus* to the World had taught,
 That pleasure was the chiefest good,
 (And was perhaps i'th' right, if rightly understood)
 His life he to his Doctrine brought,
 And in a Gardens shade that Sovereign Pleasure sought.
 Whoever a true Epicure would be,
 May there find cheap and virtuous Luxurie.
Vitellius his Table, which did hold
 As many Creatures as the Ark of old:
 That Fiscal Table, to which every day
 All Countreys did a constant Tribute pay,
 Could nothing more delicious afford,
 Than Natures Liberality,
 Helpt with a little Art and Industry,
 Allows the meanest Gard'ners board.
 The wanton Taft no Fish or Fowl can choofe,
 For which the Grape or Melon she would loose,
 Though all th' Inhabitants of Sea and air
 Be lifted in the Gluttons Bill of Fare;
 Yet still the Fruits of Earth we see
 Plac'd the third Story high in all her Luxurie.

7.
 But with no Sense the Garden does comply;
 None courts or flatters, as it does the Eye:

When

When the great *Hebrew* King did almost strain
 The wondrous Treasures of his Wealth and Brain,
 His Royal Southern Guest to entertain;
 Though he on Silver Floors did tread,
 With bright *Assyrian* Carpets on them spread,
 To hide the Metals Poverty;
 Though she look'd up to Roofs of Gold,
 And nought around her could behold
 But Silk and rich Embroidery,
 And *Babylonian* Tapettry,
 And wealthy *Hirami* Princely Dy:
 Though *Ophirs* Starry Stones met everywhere her Eye;
 Though the her self, and her gay Host were drest
 With all the shining glories of the East;
 When lavish Art her costly work had done,
 The honour and the prize of Bravery
 Was by the Garden from the Palace won;
 And every Rose and Lilly there did stand
 Better attir'd by Natures hand:
 The case thus judg'd against the King we see,
 By one that would not be so Rich, though wiser far than he.

8.
 Nor does this happy place only dispense
 Such various pleasures to the Sense,
 Here Health it self does live;
 That Salt of Life which does to all a relish give,
 Its standing Pleasure, and Intrinsic Wealth,
 The Bodies Virtue, and the Souls good Fortune, Health.
 The Tree of Life when it in *Eden* stood,
 Did its immortal head to Heaven rear;
 It lasted a tall Cedar till the Flood;
 Now a small thorny shrub it does appear;
 Nor will it thrive too every where:
 It always here is frethest seen;
 'Tis only here an Ever-green.
 If through the strong and beauteous Fence
 Of Temperance and Innocence,
 And wholesome Labours and a quiet Mind,
 And Diseases passage find,
 They must not think here to assail
 A Land unarmed, or without a Guard;
 They must fight for it, and dispute it hard,
 Before they can prevail:
 Scarce any Plant is growing here
 Which against Death some Weapon does not bear.
 Let Cities boast, that they provide
 For Life the Ornaments of Pride;
 But 'tis the Countrey and the Field,
 That furnish it with Staff and Shield.

d

Where

Where does the Wisdom and the Power Divine
In a more bright and sweet Reflection shine ?
Where do we finer strokes and colours see
Of the Creators real Poetrie,

Than when we with attention look
Upon the third days Volume of the Book ?
If we could open and intend our Eye,

We all like *Moses* should espy
Ev'n in a Bulb the radiant Deity.
But we despise these his Inferior ways,
(Though no less full of Miracle and Praise)

Upon the Flowers of Heaven we gaze;
The Stars of Earth no wonder in us raise,
Though these perhaps do more than they,
The life of Mankind sway.

Although no part of mighty Nature be
More stor'd with Beauty, Power, and Myserie;
Yet to encourage humane Industrie,
God has so ordered, that no other part
Such Space, and such Dominion leaves for Art.

We no where Art do so triumphant see,
As when it Grafts or Buds the Tree ;
In other things we count it to excell,
If it a Docile Scholar can appear
To Nature, and but imitate her well ;
It overrules, and is her Master here.

It imitates her Makers Power Divine,
And changes her sometimes, and sometimes does refine :
It does, like Grace, the fallen Tree restore
To its blest state of Paradise before :
Who would not joy to see his conquering hand
O'er all the vegetable World command ?
And the wild Giants of the Wood receive

What Law he's pleas'd to give ?
He bids th' ill-natur'd Crab produce
The gentle Apples Winy Juice ;
The golden Fruit that worthy is
Of *Galatea's* purple kifs ;
He does the savage Hawthorn teach
To bear the Medlar and the Pear,
He bids the rustick Plum to rear
A noble Trunk, and be a Peach,
Ev'n *Daphnes* coynefs he does mock,
And weds the Cherry to her stock,

Though

Though she refus'd *Apollo's* suit ;
Ev'n she, that chaff and Virgin-Tree
Now wonders at her self, to see
That she's a Mother made, and blushes in her fruit.

Methinks I see great *Dioclesian* walk
In the *salonian* Gardens noble shade,
Which by his own Imperial hands was made :
I see him smile methinks, as he does talk
With the Ambassadors who come in vain,

T' entice him to a Throne again :
If I, my Friends (said he,) should to you show
All the delights, which in these Gardens grow ;
'Tis likelier much, that you should with me stay,
Than 'tis that you should carry me away :

And trust me not, my Friends, if every day,
I walk not here with more delight,
Than ever after the most happy fight,
In Triumph to the Capitol I rod,
To thank the gods, and to be thought my self almost a god.

Chertsea, 16
Aug. 1666.

Abraham Cowley.

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THE

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SYLVA

SYLVA:

OR, A

DISCOURSE

OF


Forest-Trees,

AND

The Propagation of *Timber* in His MAJESTIES
Dominions, &c.

*Tuque ades, inceptumque una decurre laborem,
O decus, ô fama merito pars maxima nostræ,
CAROLIDE, pelagoque volans da vela petenti:
Da facilem cursum, atque audacibus annue cœptis:
Ignarosque viæ mecum miseratus agrestes
Ingredere, & votis jam nunc assuesce vocari.*

The Introduction.

- I.  Ince there is nothing which seems more fatally Introduction: to threaten a *Weakening*, if not a *Dissolution* of the strength of this famous and flourishing *Nation*, than the sensible and notorious decay of her *Wooden walls*, when either through *time*, *negligence*, or other *accident*, the present *Navy* shall be worn out and impair'd; it has been a very worthy and seasonable Advertisement in the Honourable the principal *Officers* and *Commissioners*, what they have lately suggested to this *Illustrious Society*, for the timely prevention and redress of this intolerable defect. For it has not been the late increase of *shipping* alone, the multiplication of *Glass-works*, *Iron-Furnaces*, and the like, from whence this impolitick diminution of our *Timber* has proceeded; but from the disproportionate spreading of *Tillage*, caused through that prodigious havock made by such as lately pro-
B fecting.

selling themselves against *Root* and *Branch* (either to be re-im-burs'd for their *Holy* purchases, or for some other sordid respect) were tempted, not only to *fell*, and *cut down*, but utterly to *extirpate*, *demolish*, and *raze*, as it were, all those many goodly *Woods*, and *Forests*, which our more prudent *Ancestors* left standing, for the Ornament, and service of their *Country*. And this *devastation* is now become so *Epidemical*, that unless some favourable *expedient* offer it self, and a way be seriously, and speedily resolv'd upon, for a future store, one of the most glorious, and considerable *Bulwarks* of this *Nation*, will, within a short time, be totally wanting to it.

2. To attend now a *spontaneous* supply of these decay'd *Materials* (which is the vulgar, and natural way) would cost (besides the *Inclosure*) some entire Ages repose of the *Plow*: Therefore, the most expeditious, and obvious *Method*, would doubtless be, one of these *two* ways, *Sowing*, or *Planting*. But, first, it will be requisite to agree upon the *Species* ; as what *Trees* are likely to be of greatest *Use*, and the fittest to be cultivated; and then, to consider of the *Manner* how it may best be effected. Truly, the *waste*, and *destruction* of our *Woods*, has been so universal, that I conceive nothing less than an *universal* *Plantation* of *all the sorts of Trees* will supply, and well encounter the defect ; and therefore, I shall here adventure to speak something in general of them *all* ; though chiefly insist upon the propagation of *such* only as seem to be the most wanting, and serviceable to the end propos'd.

3. And first by *Trees* here, I consider principally for the *Genus generalissimum*, such *Lignous* and woody *Plants*, as are *hard* of substance, *procure* of *figure*; that are *thick* and *solid*, and stiffly adhere to the *Ground* on which they stand: These we shall divide into the *Greater* and more *Ceduous*, *Frustrant* and *Shrubby*; *Feras* and wild; or more *Civiliz'd* and domesticke; and such as are *satise* and *Hortenful* bialternate to the other; But of which I give only a touch, distributing the *rest* into these two *Classes*, the *Dry*, and the *Aquatic*; both of them applicable to the same civil uses of *Building*, *Utensils*, *Ornament*, and *Fuels*; for to dip into their *Medicinal* virtues is none of my *Province*, though I sometimes glance at them with due *submission*, and in few *Instances*.

4. Among the *dry*, I esteem the more principal, and solid, to be the *Oak, Elme, Beech, Ash, Chest-nut, Wall-nut, &c.* The less principal, the *Service, Maple, Lime-tree, Horn-beam, Quick-beam, Birch, Hazel, &c.* together with all their *sub-alternate*, and several kinds,

—Which of how many forts
We can't stand here at present to declare.

*Sed neque quàm multæ species, nec nomina quæ sint,
Est numerus, Geor. 2.*

5. Of the *Aquatical*, I reckon the *Poplars, Asp, Alder, Willow, Sal-*
low, Ofer, &c. Then I shall add a word or two, for the encourage-
 ment of the planting of *fruit-trees*, together with some less *vulgar*,
 but no less *useful* Trees, which, as yet are not *endenizor'd* amongst
 us, or (at least) not much taken notice of: And in pursuance here-
 of, I shall observe this *order*: First, to shew how they are to be
Raised, and then *Cultivated*; By *raising*, I understand the *Seed*
 and

and the Soil ; by Culture the Planting, Fencing, Watering, Dressing, Pruning and Cutting ; of all which briefly.

6. And *first* for their *Raising*, some there are;

Spring of *themselves* *unforc'd* by human care,

Nullis hominum cogentibus, ipsa
Sponte sua veniant

Specifying according to the various disposition of the *Air* and *Soil*;

Some from their *Seeds* arise.

Pars autem posito surgunt de semine.

As the *Oak*, *Chest-nut*, *Ash*, &c.

Some to thick Groves from their own Roots do spring, *Pullulat ab radice alius densissima Sylva.*

As the *Elme*, *Alder*, &c. and there are others

Grow without Root,

Nil radicis egent.

as *Willows*, and all the *Vimineous* kinds, which are raised of *Setts* only.

These ways first Nature gave,

Hōs natura modos primum dedēit —

For thus we see there are more ways to the *Wood* than one; and he has furnish'd us with variety of expedients.

7. And here we might fall into a deep *Philosophical* Research; whether the *Earth* it self in some place thereof or other, even without *Seed*, *Branch* or *Root*, &c. would produce every kind of *Vegetable*; as it manifestly does divers sorts of *Grafs* and *Plants*? (*viz.*) the *Tre-fole* or *Clover* in succulent land; In dry ground, *May* and *Rag-weeds*; In the very moist, *Ros-folis*, *Argentina*, *Flag*, &c. And the very barren, *Fern*, *Broom*, and *Heath*, &c. So *Virgil* notes sterile places for the *Pitch-tree*; we our wet and *Uliginous* for *Birch*, *Alder*, &c. The more lofty, poor and perflatile for *Tew*, *Guiniver*, *Box*, and the like; and we read in the *Natural Hifories* of divers *Countries*, that the *Cedar*, *Palmeto*, *Queen-Pines*, *Ebony*, *Nutmeg*, *Cinnamon*, &c. for *Trees*; the *Tulip*, *Hyacinth*, *Crocus*, &c. for *Flowers*, are sometimes, and in some regions *Aborigens*, defended immediately from the *Genius* of the *Soyle*, *Climate*, *Sun*, *Shade*, *Air*, *Winds*, *Water*, *Nitrous Salts*, *Rocks*, *Bank*, *Shore*, and (as the *Negor-Heads* in the *Barbados*) even without *Seed*, or at least any perceptible rudiment. For with all this we are not satisfied without supposing some previous *feminal* disposition lurking, and dispers'd in every part of the *Earth*, in what *Molecule* or *fubtile contextures* we shall not enquire, but though haply not at first so perfect as the maturer *Seed*, of their after peculiar *Plants*; yet such as are fit for the *Sun* and *Influences* to operate on, 'till they have prepar'd, diffus'd, and excited their *Seminal*, and *Prolifigue* vertue to exert it self and awake out of sleep, in which they lie as in their *caufes*, freeing themselves from those impediments which hindered their *Specification* and *Nativity*: This Conception the learned *Gassendus* would illustrate by the latent *fire* in *Flint*, which never betrays it self 'till it be forced out by *Collifion*; but which yet methinks, does not so fully enlighten this *Hypothesis*, which we only hint for Method

C H A P. I.

Of the Soil, and of Seed.

Soil.

i. **H**ere, for *Methods* sake, something it were expedient to premise concerning the *Soil*; and indeed I do acknowledge to have observ'd so vast a *difference* in the Improvement of *Woods*, by that of the *Ground*; that it is at no hand to be neglected: But this being more than Transitorily touched in each *Chapter* of the ensuing *Discourse*, I shall not need to assign it any apart, when I have affirm'd in General, that most *Timber-Trees* grow and prosper well in any tolerable *Land* which will produce *Corn* or *Rye*, and which is not in excess *stony*; in which nevertheless there are some *Trees* delight; or altogether *Clay*, which few, or none do naturally affect; And yet the *Oak* is seen to prosper in it, for its toughness prefer'd before any other by many *Workmen*, though of all *Soils* the *Cow-pasture* doth certainly exceed, be it for what purpose soever of planting *Wood*. Rather therefore we should take notice how many great *Wits* and *ingenious* Persons, who have leisure and faculty, are in pain for *Improvements* of their *Heaths* and barren *Hills*, cold and starving places, which causes them to be neglected and despair'd of; whilst they flatter their hopes and vain expectations with fructifying liquors, *Chymical Menstrues* and such vast conceptions; in the mean time that one may shew them as *Heathy* and *Hopeless* grounds, and barren *Hills* as any in *England*, that do now bear, or lately have born *Woods*, *Groves*, and *Copps* which yield the *Owners* more *wealth*, than the richest and most opulent *Wheat-lands*: And if it be objected that 'tis so long a day before these *Plantations* can afford that gain; *The Brabant Nurseries*, and divers home-plantations of *Industrious persons* are sufficient to convince the gain-sayer. And when by this *Husbandry* a few *Acorns* shall have peopl'd the Neighboring *Regions* with young *Stocks* and *Trees*; the residue will become *Groves* and *Copps* of infinite delight and satisfaction to the *Planters*. Besides, we daily see what *Course Lands* will bear these *Stocks* (suppose them *Oaks*, *Wall-nuts*, *Chest-nuts*, *Pines*, *Firrs*, *Asps*, *Wild-Pears*, *Crabs*, &c.) and some of them (as for instance the *Pear* and the *Fir* or *Pine*) strike their *Roots* through the roughest and most impenetrable *Rocks* and clefts of *Stone* it self; and others require not any rich or pinguid, but very moderate *Soil*; especially, if committed to it in *Seeds*, which allies them to their *Mother* and *Nurse* without renitency or regret: And then considering what assistances a little *Care* in casing and stirring of the ground about them for a few years does afford them: What cannot a strong *Plow*, a *Winter* mellowing, and *summer* heats, incorporated with the pregnant *Turf*, or a slight assistance of *Lime*, *Loam*, *Sand*, rotten *compost*, discreetly mixed (as the case may require) perform

perform even in the most unnatural and obstinate *Soil*? And in such places where anciently *Woods* have grown, but are now unkind to them, the fault is to be reformed by this *Care*; and chiefly, by a sedulous extirpation of the old remainders of *Roots*, and latent *Stumps*, which by their *mustiness*, and other pernicious qualities, sowre the ground, and poison the *Conception*; And herewith let me put in this note, that even the *Soil* it self does frequently discover and point best to the particular *Species*, though some are for all places alike: but I shall say no more of these *particulars* at this time, because, the rest is sprinkl'd over this *whole* *Work* in their due places; Wherefore we hasten to the following *Title*, namely, the choice and ordering of the *Seeds*.

2. Chuse your *Seed* of that which is perfectly *mature*, *ponderous* *Seed*, and *sound*; commonly that which is easily shaken from the *boughs*, or gathered about *November*, immediately upon its spontaneous fall, or taken from the tops and summities of the fairest, and soundest *Trees*, is best, and does (for the most part) direct to the proper season of *sowing*, &c. According to *Institution*. For,

Nature her self who all created first,
Invented sowing, and the wild Plants nurs'd:
When Mast and Berries from the Trees did drop,
Succeeded under by a numerous Crop.

Nam speculum sativis, & infansis origo
Ipsa fuit verum primum natura creatrix:
Arboribus quoniam vacce, glandisque caduce
Tempestivus dabant pullorum examina subter, &c.

Lucret. l. 9.

Yet this is to be consider'd, that if the *place* you sow in be too cold for an *Autumnal* sowing, your *Acorns*, *Mast*, and other *Seeds* may be prepared for the *Vernal* by being barrl'd, or potted up in moist *Sand*, or *Earth stratum* &c. during the *Winter*; at the expiration whereof you will find them *sprouted*; and being committed to the *Earth*, with a tender hand, as apt to *take* as if they had been sown with the most early, may with great advantage: by this means, too, they have escap'd the *Vermine* (which are prodigious devourers of *Winter* sowing) and will not be much concern'd with the increasing heat of the *Season*, as such as being crude, and *unfermented* are newly sown in the beginning of the *Spring*; especially, in hot and loose *Grounds*; being already in so fair a progress by this artificial preparation; and which (if the provision to be made be very great) may be thus manag'd. Chuse a fit piece of *Ground*, and with boards (if it have not that *position* of it self) design it three foot high; lay the first foot in fine *Earth*, another of *Seeds*, *Acorns*, *Mast*, *Keys*, *Nuts*, *Haws*, *Holly-berries*, &c. Promiscuously, or separate, with (now, and then) a little *Mould* sprinkled amongst them: The third foot wholly *Earth*: Of these preparatory *Magazines* make as many, and as much larger ones as will serve your turn, continuing it from time to time as your *store* is brought in. The same for ruder handlings may you also do by burying your *Seeds* in dry *Sand*, or pulveriz'd *Earth*, *Barralling* them (as I said) in *Tubs*, or laid in heaps in some deep *Cellar* where the rigour of the *Winter* may least prejudice them; and I have fill'd old *Hamper*s, *Bee-hives*, and *Boxes* with them, and found the like advantage, which is to have them ready for your *Seminary*, as before hath been shew'd, and exceedingly prevent the season. There be also who

who affirm, that the careful cracking and opening of *Stones* which include the *Kernels*, as soon as ripe, precipitate *Growth* and gain a *years* advance; but this is erroneous. Now if you gather them in moist weather, lay them a drying, and so keep them till you *see*, which may be as soon as you please after *Christmas*. If they sprout before you sow them, be sure to commit them to the earth before the *Sprout* grows dry, or else expect little from them.

3. But to pursue this to some farther Advantage; as to what concerns the election of your *Seed*, It is to be consider'd, that there is vast difference, (what if I should affirm more than an *hundred years*) in *Trees* even of the same *growth* and *Bed*, which I judge to proceed from the variety and quality of the *Seed*: This, for instance, is evidently seen in the *heart, procerity* and stature of *Timber*; and therefore chuse not your *Seeds* always from the most *Fruitful-trees*, which are commonly the most *Aged*, and decayed; but from such as are found most *solid* and *fair*: Nor, for this reason, covet the largest *Acorns*, &c. but (as *Husbandmen* do their *Wheat*) the most *weighty, clear* and *bright*: This Observation we deduce from *Fruit-trees*, which we seldom find to bear so kindly, and plentifully, from a *sound* stock, *smooth* Rind, and *firm* Wood, as from a *rough, lax*, and *untoward* Tree, which is rather prone to spend it self in *Fruit*, (the ultimate effort, and final endeavour of its most delicate *Sap*), than in *solid* and *close Substance* to encrease the *Timber*. And this shall suffice, though some haply might here recommend to us a more accurate *Microscopical* examen, to interpret their most secret *Schematisms*, which were an over nicety for these great *Plantations*.

4. As concerning the *medicating*, and *insuccation* of *Seeds*, or enforcing the *Earth* by rich and generous *Composts*, &c. for *Trees* of these kinds, I am no great favourer of it; not only, because the *charge* would much discourage the *Work*; but for that we find it unnecessary, and for most of our *Forest-trees*, noxious; since even where the ground is too fertile, they thrive not so well; and if a *Mould* be not proper for one sort, it may be fit for another: Yet I would not (by this) hinder any from the trial, what advance such *Experiments* will produce: In the mean time, for the simple *Imbibition* of some *Seeds* and *Kernels*, when they prove extraordinary dry, as the Season may fall out, it might not be amiss to *macerate* them in *Milk*, or *Water* only, a little *impregnated* with *Cow-dung*, &c. during the space of twenty four hours, to give them a *spirit* to sprout, and *cheer* the sooner; especially, if you have been retarded in your *sowing* without our former preparation: But concerning the *mould, soiling*, and preparations of the *ground*, I refer you to my late *Treatise of Earth*, if what you meet with in *this* do not abundantly encounter all those difficulties.

5. Being thus provided with *Seeds* of all kinds, I would advise to raise *Woods* by sowing them *apart*, in several places destin'd for their growth, where the *Mould* being prepar'd (as I shall shew hereafter) and so qualified (if election be made) as best to suit with the nature of the *Species*, they may be sown *promiscuously*; which

is the most natural and *Rural*; or in *streight*, and even *lines*, for *Hedge-rows, Avenues*, and *Walks*, which is the more *Ornamental*: But, because some may chuse rather to draw them out of *Nurseries*; that the *Culture* is not much different, nor the hindrance considerable (provided they be early, and carefully Removed) I will finish what I have to say concerning these *Trees* in the *Seminary*, and shew how they are *there* to be *Raised, Transplanted*, and *Govern'd* till they can shift for themselves.

CHAP. II.

Of the Seminary.

1. *Qui Vincam, vel Arbustum consistere volet, Seminaria prius facere debet*, was the precept of *Columella*, l. 3. c. 5. speaking of *Vineyards* and *Fruit-trees*: and, doubtless, we cannot pursue a better Course for the Propagation of *Timber-trees*: For though it seem but a trivial design that one should make a *Nursery of Foresters*; yet it is not to be imagin'd, without the experience of it, what prodigious *Numbers* a very small *spot* of ground well Cultivated, and destin'd for this purpose, would be able to furnish towards the sending forth of yearly *Colonies* into all the naked quarters of a *Lordship*, or *Demeafnes*: Being with a pleasant *Industry* liberally distributed amongst the *Tenants*, and dispos'd of about the *Hedge-rows*, and other *Waste*, and uncultivated places, for *Timber, Shelter, Fuel*, and *Ornament*, to an incredible Advantage. This being a cheap, and laudable Work, of so much pleasure in the execution, and so certain a profit in the event; to be but once well done (for, as I affirm'd, a very small *Nursery* will in a few years people a vast extent of Ground) hath made me sometimes in admiration at the universal negligence.

2. Having therefore made choice of such *Seeds* as you would sow, by taking, and gathering them in their just *season*; that is, when *dropping ripe*; and (as has been said) from fair *thriving* Trees; and found out some fit place of *Ground*, well *Fenced*, respecting the *South East*, rather than the full *South*, and well protected from the *North* and *West*;

He that for wood his Field would sow,
Must clear it of the *Shrubs* that grow;
Cut Brambles up, and the Ferns grow.

Qui sere ingenuum velit agrum;
Liberat prius arva fructibus;
Falce ramos, silectisque reficit.

Boeth. l. 2. Met.

This done, let it be *Broken up* the *Winter* before you *sow*, to mellow it; especially if it be a *Clay*, and then the *furrow* would be made deeper: or so, at least; as you would prepare it for *Wheat*: Or you may *Trench* it with the *spade*, by which means it will the easier be cleansed of whatsoever may obstruct the putting forth, and insinuating of the tender *Roots*: Then, having given it a second

firring, immediately before you *sow*, cast, and dispose it into *Rills*, or small narrow *Trenches* of four, or five inches deep, and in even lines, at two foot interval, for the more commodious *Excavation*, *Hawing*, and dressing the Trees: Into these *Furrows* (for a *Consemeine Sylva*) throw your *Oak*, *Beech*, *Ash*, *Nuts*, all the *Glandiferous Seeds*, *Mast*, and *Key-bearing* kinds, so as they lie not too thick, and then cover them very well with a *Rake*, or fine-tooth'd *Harrow*, as they do for *Pease*: Or, to be more accurate, you may set them as they do *Beans* (especially, the *Nuts* and *Acorns*) and that every *Species* by themselves, for the *Roboraria*, *Glandaria*, *Ulmaria*, &c. which is the better way: This is to be done at the latter end of *October*, for the *Autumnal* sowing; and in the lighter ground about *February* for the *Vernal*.

Then see your hopeful *Grosv* with *Acorns* sown,
But e're your *Seed* into the Field be thrown,
With crooked *Plough* first let the lusty *Swaiv*
Break-up, and stubborn *Clodds* with *Harrow* plain.
Then, when the *Stem* appears, to make it bare
And lighten the hard *Earth* with *Hough*, prepare.
Hough in the *Spring*: nor frequent *Culture* still,
Left noxious *Weeds* o're the young *Wood* prevail:
To barren ground with toyle large measure add,
Good-husbandry will force a Ground that's bad.

*Proinde nemus sparsa cures de glande parandum:
Sed tamen ante tuo mardes quam semina campo:
Iste tibi dabo robustas vomere jossor
Omne solum subigat latus, explanetque substatum.
Cumque novus filio primum de germine vireat
Flandis humum, rursus ferro vofanda bicorai
Constita vire novo tellus, cultusque frequenti
Excandae, virbe circum ne forte nocentes
Proveniant, germinetque ipsum radicibus urant.
Ite cultu campum cunctantem nigore frequent,
Et saturare sump pudent, si forte resistat
Cultura: nam tristis humo soporanda colenda est.*

Rapinus l. 2.

Note that 6 *Bushels* of *Acorns* will sow or plant an Acre, at one foot distance.

3. Your *Plants* beginning now to peep, should be *earthed* up, and comforted a little; especially, after breaking of the greater *Frosts*, and when the swelling mould is apt to spue them forth; but when they are about an *inch* above ground, you may in a *moist* season, draw them up where they are too *thick*, and set them immediately in other *lines*, or *Beds* prepar'd for them; or you may plant them in double *fosses*, where they may abide for good and all, and to remain till they are of a competent stature to be *transplanted*; where they should be set at such *distances* as their several *kinds* require; but if you draw them only for the thinning of your *Seminary*, prick them into some empty *Beds* (or a *Plantarium* purposely design'd) at one foot *interval*, leaving the rest at two or three.

4. When your *Seedlings* have stood thus till *June*, bestow a slight digging upon them, and scatter a little *mungy*, half-rotten *Littier*, *Fearn*, *Bean-hume*, or old *Leaves* among them, to preserve the *Roots* from scorching, and to entertain the moisture; and then in *March* following (by which time it will be quite consum'd and very mellow) you shall *chop* it all into the *earth*, and mingle it together: Continue this *process* for two or three years successively; For till then, the substance of the *Kernel* will hardly be spent in the plant, which is of main import; but then (and that the stature of your young *Imes* invite) you may plant them forth, carefully taking up their *Roots*, and cutting the *Stem* within an *inch* of the ground (if the *kind*, of which hereafter, suffer the *knife*) set them where they are to continue: If thus you reduce them to the

the distance of forty foot; the *Intervals* may be planted with *Ash*, which may be sell'd either for *Poles*, or *Timber* without the least prejudice of the *Oak*: Some repeat the *cutting* we spake of the second *Year*, and after *March* (the *Moon* decreasing) re-cut them at half a foot from the *surface*; and then meddle with them no more: but this (if the *process* be not more severe than needs) must be done with a very sharp *Instrument*; and with care, lest you violate, and unsettle the *Roots*, which is likewise to be practis'd upon all those which you did not *Transplant*, unless you find them very thriving *Trees*; and then it shall suffice to prune off the *Branches*, and spare the *Tops*; for this does not only greatly establish your *Plants* by diverting the *Sap* to the *Roots*; but likewise frees them from the injury and concussions of the *Winds*, and makes them to produce handfom, straight *shoots*; infinitely preferable to such as are abandon'd to *Nature*, and *Accidents*, without this discipline: By this means the *Oak* will become excellent *Timber*, shooting into straight, and single *Stems*: The *Chest-nut*, *Ash*, &c. multiply into *Poles*, which you may reduce to *Standards* at pleasure: To this I add, that as oft as you make your annual *Transplanting*, out of the *Nursery*, by drawing forth the choicest *Stocks*, the remainder will be improved by a due stirring, and turning of the mould about their *Roots*.

5. *Theophrastus* in his third Book de *Causis* c. 7. gives us great caution in planting to preserve the *Roots*, and especially the *Earth*, adhering to the smallest *Fibers*, which should by no means be shaken off, as most of our *Gardeners* do to trim and quicken them as they pretend, which is to cut them shorter, &c. not at all considering, that those tender *Hairs* are the very *mouths*, and *Vehicles* which suck in the nutriment, and transfuse it into all the parts of the *Tree*, and that these once perishing, the thicker and larger *Roots*, hard, and less spongie, signify little but to establish the *Stem*; as I have frequently experimented in *Orange-Trees*, whose *Fibers* are so very obnoxious to rot, if they take in the least excess of wet: And therefore *Cato* advises us to take care that we bind the mould about them, or transfer the *Roots* in *Baskets*, to preserve it from forsaking them; For this *Earth* being already applied, and fitted to the *overtures* and *mouths* of the *Fibers*, it will require some time to bring them in appetite again to a new mould, by which to repair their loss, furnish their *stock*, and proceed in their wonted *Oeconomy* without manifest danger and interruption: Nor less ought our care to be in the making, and dressing of the *pits* and *fosses* into which we design our *Transplantation*, which should be prepar'd and left some time open to macerating *Rains*, *Frosts*, and *Sun*, that may resolve the compacted *Salt*, render the *Earth* friable, mix and qualifie it for aliment, and to be more easily drawn in, and digested by the *Roots* and analogous *Stomach* of the *Trees*: This, to some degree may be artificially done, by burning of *straw* in the newly opened *Pits*, and drenching the mould with *Waters*; especially in over dry seasons, and by meliorating barren-ground with sweet, and comminuted *Scatations*.

C 2

6. The

6. The Author of the *Natural History, Pliny*, tells us it was a vulgar *Tradition*, in his time, that no *Tree* should be Removed under two years old, or above three: *Cato* would have none *Transplanted* less than five fingers in *diameter*; But I have shew'd why we are not to attend so long for such as we raise of *Seedlings*: In the interim, if these directions appear too busy, or *superfluous*, or that the *Plantation* you intend be very ample, a more compendious *Method* will be the consulted sowing of *Acorns*, &c. in *Furrows*, two foot asunder, covered at three fingers depth, and so for three years cleaned, and the first *Winter* cover'd with *straw*, without any farther culture, unless you *Transplant* them; but, as I shew'd before, in *Nurseries*, they would be cut an *inch* from the Ground, and then let stand till *March* the second year, when it shall be sufficient to *disbranch* them to one only shoot, whether you suffer them to *stand*, or remove them elsewhere. But to make an *Essay* what *Seed* is most agreeable to the *soil*, you may by the *thriving* of a promiscuous *Semination* make a judgment of,

What each Soil bears, and what it does refuse.

Quid quaque ferat regio, & quid quaque recuset.

Transplanting those which you find least agreeing with the *places* or *else*, by *Copied* the *starvelings* in the places where they are newly sown, cause them sometimes to overtake even their untouch'd *contemporaries*.

7. But here some may inquire what *distances* I would generally assign to *Transplanted Trees*? To this somewhat is said in the ensuing *Periods*, and as occasion offers; though the promiscuous rising of them in *Forest-Work*, wild, and *natural* is to us *acknowledged* more pleasing, than all the studied accuracy in ranging of them; unless it be, where they conduct, and lead us to *Avenues*, and are planted for *Vistas* (as the *Italians* term is) in which case, the proportion of the *Breadth*, and *Length* of the *Walks*, &c. should govern, as well as the Nature of the *Tree*, with this only note; That such *Trees* as are rather apt to spread, than mount (as the *Oak*, *Beech*, *Walnut*, &c.) be dispos'd at wider intervals, than the *other*, and such as grow best in *Consort*, as the *Elm*, *Ash*, *Lime-tree*, *Sycamore*, *Fir*, *Pine*, &c. regard is likewise to be had to the quality of the *soil*, for this work: V. G. If *Trees* that affect cold and moist grounds, be planted in hot and dry places, then set them at closer Order; but *Trees* which love scorching and dry Grounds at farther distance: The like rule may also guide in situations expos'd to impetuous *Winds* and other accidents, which may serve for general *Rules* in this piece of *Tactics*.

8. To leave nothing omitted which may contribute to the stability of our *Transplanted Trees*, something is to be premis'd concerning their *staking*, and securing from external injuries, especially from *Winds* and *Cattel*, against both which, such as are planted in *Copses*, and for ample *Woods*, are sufficiently defended by the *Mounds* and their closer order; especially, if they rise of *Seed*: But where they are expos'd in *single rows*, as in *Walks*, and *Avenues*, the

the most effectual course is to *embrace* them with three good quarter *stakes*, of competent length set in *triangle* and made fast to one another by short pieces above and beneath; in which a few *Brambles* being stuck, secure it abundantly without that choking or fretting, to which *Trees* are obnoxious that are only single *staked* and *brushed* as the vulgar manner is; Nor is the charge of this so considerable, as the great advantage, accounting for the frequent reparations which the other will require. Where *Cattel* do not come, I find a good piece of *Rope*, tyed fast about the neck of *Trees* upon a *miss* of *straw* to preserve it from galing, and the other end tightly stic'd to a *hook* or *peg* in the ground (as the *shrouds* in *ships* are fastned to the *Masts*), sufficiently stabilizes my *Trees* against the *Western* blasts without more trouble; for the *Winds* of other quarters seldom infect us. But these *Cords* had need be well *pitch'd* to preserve them from wet, and so they will last many Years. I cannot in the mean time conceal what a noble Person has assur'd me, that in his goodly *Plantations* of *Trees* in *Scotland*, where they are continually expos'd to much greater, and more impetuous *Winds*, than we are usually acquainted with; he never *stakes* any of his *Trees*; but upon all dangers of this kind, causes only his *servants* to *redress*, and set them up again as often as they happen to be overthrown; which he has assur'd to me, thrives better with them, than with those which he has *staked*; and that at last they strike root so fast, as nothing but the *Axe* is able to prostrate them; and there is good reason for it in my opinion, whilst these concussions of the *Roots*, loosning the *mould*, not only make room for their more easie insinuations, but likewise opens, and prepares it to receive, and impart the better nourishment. It is in another place I suggest that *Transplanted Pines* and *Firrs*, for want of their penetrating *Tap roots*, are hardly consistent against these *Gusts* after they are grown high; especially, where they are set close, and in *Tufts*, which betrays them to the greater disadvantage; And therefore such *Trees* do best in *Walks*, and at competent distances where they escape tolerably well: Such therefore as we design for *Woods* of them, should be sown'd, and never remov'd. In the mean time, many *Trees* are also propagated by *Cuttings*, and *Layers*; the *Ever-greens* about *Bartholomew-tide*; other *Trees* within two, or three months after, when they will have all the *sap* to assist them; every body knows the way to do it is by slitting the *branch* a little way, when it is a little cut directly in, and then to plunge it half a foot under good mould, and leaving as much of its extremity above it, and if it comply not well, to peg it down with an *hook* or two, and so when you find it competently rooted, to cut it off beneath, and plant it forth: Other expedients there are by *twisting* the part, or *baring* it of the *Rind*; and if it be out of reach of the ground, to fasten a *tub* or *basket* of *Earth* near the *branch*, fill'd with a succulent mould, and kept as fresh as may be. For *Cuttings*, about the same season, take such as are about the bigness of your *Thumb*, setting

setting them a *foot* in the *Earth*, and near as much out. If it be of soft wood, as *Willows*, *Poplar*, *Alders*, &c. you may take much larger *Trunchions*, and so tall as *Cattel* may not reach them; if *harder*, those which are young, small and more tender; and if such as produce a *knur*, or *burry* swelling, set that part into the ground, and be sure to make the *hole* so wide, and point the end of your *Cutting* so smooth, as that in setting it violate, and strip none of the *bark*; the other extrem may be slanted, and so treading the *Earth* close, and keeping it *moist*, you will seldom fail of success: By the *Roots* also of a thriving, lusty and fappy Tree; more may be propagated; to effect which, early in *Spring*, dig about its *foot*, and finding such as you may with a little cutting bend upwards, raise them above ground three or four inches, and they will in a short time make *Shoots*, and be fit for *transplantation*; or in this work you may quite separate them from the mother *Root* and cut them off: By *baring* likewise the bigger *Roots* discreetly, and hacking them a little, and then covering with fresh mould, *Suckers* may be raised in abundance, which drawing competent *Roots*, will soon furnish store of plants, and this is practicable in *Elmes* especially, and all such *Trees*, as are apt of themselves to put forth *Suckers*; but of this more upon occasion hereafter. I now proceed to particulars.

CHAP.

CHAP. III.

Of the Oak.

1. *Robur*, the *Oak*, I have sometimes consider'd it very seriously, ^{and} what should move *Pliny* to make a whole *Chapter* of one only *Line*, which is less than the *Argument* alone of most of the rest in his huge *Volume*: but the weightiness of the *Matter* does worthily excuse him, who is not wont to spare his *Words*, or his *Reader*. *Glandiferi maximè generis omnes, quibus bonos apud Romanos perpetuus.* "Mast-bearing-trees were principally those which the Romans held in chiefest repute, lib. 6. cap. 3. And in the following where he treats of *Chaplets*, and the dignity of the *Civic Coronet*, it might be compos'd of the *Leaves* or *Branches* of any *Oak*, provided it were a *bearing Tree*, and had *Acorns* upon it. It is for the esteem which these *wise*, and glorious people had of this *Tree* above all others, that I will first begin with the *Oak*; and indeed it carries it from all other *Timber* whatsoever, for the building of *ships*, being tough, bending well, strong and not too heavy, nor easily admitting water.

2. 'Tis pity that the several kinds of *Oak* are so rarely known amongst us, that wherever they meet with *Quercus*, they take it promiscuously for our *Common Oak*, whereas there be many Species of that goodly *Tree*, though we shall take notice of *Four* only, *Two* of which are most frequent with us; (for we shall say little of the *Cerris* or *Ægilops*, goodly to look on, but for little else: some have mistaken it for *Beech*, whereas indeed it is a kind of *Oak* bearing a small round *Acorn* almost covered with the *Cup*, which is very rugged, the *Branches* loaded with a long *Moss* hanging down like dechevell'd hair, which much annoys it. There is likewise the *Effulus*, which though *Vitruvius*, *Plinie*, *Delcampius* and others take for a smaller kind, *Virgil* celebrates for its spreading, and profound root, and this *Delcampius* will therefore have to be the *Platylabus* of *Theophrastus*, and as our *Botanics* think, his *Phegos*, as producing the most edible fruit. But to confine our selves;) The *Quercus urbana*, which grows more up-right, and being clean, and lighter is fittest for *Timber*: And the *Robur* or *Quercus Sylvestris*, (taking *Robur* for the general name, at least, as *contradistinct* from the rest) which is of an hard, black grain, bearing a smaller *Acorn*, and affecting to spread in *branches*, and to put forth his *Roots* more above ground; and therefore in the planting, to be allow'd a greater distance; viz. from twenty five, to forty foot; (nay sometimes as many yards) whereas the other shooting up more erect will be contented with fifteen: This kind is farther to be distinguished by his fullness of leaves, which tarnish, and becoming yellow at the fall, do commonly clothe it all the *Winter*, the *Roots* growing very deep and stragling. The Author of *Britannia Ba-*
conica

conica speaks of an *Oak*, in *Lanbadron Park* in *Cornwall*, which bears constantly leaves speckl'd with White; and of another call'd the *Painted Oak*; others have been found at *Frid-wood* near *Sittingbourn* in *Kent*, as also *Sycamore*, and *Elms* in other places mentioned by the learned *Dr. Plot* in his *Nat. Hist. of Oxfordshire*, which I only mention here, that the variety may be compar'd by some ingenious person thereof, as well as the truth of the fatal *pre-admonition* of *Oaks* bearing strange leaves. There is likewise a kind of *Hemeris* or *Dwarf Oak* frequent in *New-England*, which (bearing *Acorns*) might easily be propagated here, if it were worth the while.

3. I shall not need to repeat what has already been said *cap. 2.* concerning the raising of this Tree from the *Acorn*; they will also endure the *laying*, but never to advantage of bulk or stature: It is in the mean time the propagation of this large spreading *Oak*, which is especially recommended for the excellency of the *Timber*, and that his *Majesties* Forests were well, and plentifully stor'd with them; because they require *room*, and space to amplify and expand themselves, and would therefore be planted at more remote distances, and free from all encumbrances: And this upon consideration how slowly a full-grown *Oak* mounts upwards, and how speedily they spread, and dilate themselves to all quarters, by dressing and due culture; so as above forty years advance is to be gain'd by this only Industry: And, if thus his *Majesties* Forests, and *Chases* were stor'd, *viz.* with this spreading Tree at handsom *Intervals*, by which *Grazing* might be improv'd for the feeding of *Deer* and *Cattel* under them, (for such was the old *salus*.) benignly visited with the gleams of the *Sun*, and adorn'd with the distant *Land-skip*s appearing through the glades, and frequent *Vallies*;

(—) berwix
Whose rows the azure Skie is seen immix'd,
With *hills*, *Valles*, and *Fields*, as now we see
Distinguish'd in a sweet variety;
Such places which wild *Apple-trees* throughout
Adorn, and happy *Shrubs* grow all about.)

As the *Poet* describes his *Olive-groves*, nothing could be more ravishing; for so we might also sprinkle *Fruit-trees* amongst them (of which hereafter) for *Cider*, and many singular uses, and should find such goodly *Plantations* the boast of our *Rangers*, and *Forests* infinitely preferable to any thing we have yet beheld, *rude*, and neglected as they are: I say, when his *Majesty* shall proceed (as he hath design'd) to animate this laudable pride into fashion, *Forests* and *Woods* (as well as *Fields* and *Inclosures*) will present us with another face than now they do. And here I cannot but applaud the worthy Industry of old Sir *Harbottle Grimstone*, who (I am told) from a very small *Nursery* of *Acorns*, which he sow'd in the neglected corners of his ground, did draw forth such numbers of *Oaks* of competent growth; as being planted about his *Fields* in even, and uniform rows, about one hundred foot from the *Hedges*; built'd, and well water'd till they had sufficiently fix'd themselves, did

(Cœnula distinguens inter plaga cœvere possit
Per tumulas, & convallies, camposque profusa:
Ut nunc esse vidas vario distincta lepro
Omnia, que pontis interstitia dulcibus orant
Arbustisque tuant sollicitus obstita circum.)
Lucret. l. 9.

did wonderfully improve both the beauty, and the value of his *Demeasnes*. But I proceed.

4. Both these *kinds* would be taken up very young, and *Transplanted* about *October*; some yet for these hardy, and late springing *Trees*, defer it till the *Winter* be well over; but the Earth had need be moist; and though they will grow tolerably in moist grounds; yet do they generally affect the *sound, black, deep and fast* mould, rather warm than over wet and cold, and a little rising; for this produces the firmest *Timber*; though my *L. Bacon* prefer that which grows in the *moister* grounds for *Ship-timber*, as the most *tough*, and less subject to *rust*: but let us hear *Pliny*. This is a general Rule, *saith he*; "What *Trees* soever they be which grow tolerably either on *Hills*, or *Vallies*, arise to greater stature, and spread more amply in the lower ground: But the *Timber* is far better, and of a finer grain, which grows upon the *Mountains*; excepting only *Apple*, and *Pear-trees*. And in the 39 *cap lib. 16.* The *Timber* of those *Trees* which grow in *moist*, and *shady* places, is not so good as that which comes from a more expos'd situation, nor is it so close, substantial and durable; upon which he much prefers the *Timber* growing in *Tuscany*, before that towards the *Venetian* side, and upper part of the *Gulph*: And that *Timber* so growing, was in greatest esteem long before *Pliny*, we have the *spear* of *Agamemnon* *ἔκαστος ἀμυμονοειὲς ἔργον*. *Id. l. 1.* from a Tree so expos'd; and *Didymus* gives the reason. *Τὰ γὰρ ἐκ ἀέρος* (says he) *ἀντὶ τὴν ἀνὰ τὴν ἀέρος* *ἄνεμος, κύμα, &c.* For that being continually weather-beaten they become harder and tougher: Otherwise, that which is wind-shaken, never comes to good; and therefore, when we speak of the *Climate*, 'tis to be understood of *Vallies* rather than *Hills*, and in *calm* places, than *exposed*, because they shoot straight and upright. The result of all is, that upon occasion of special *Timber*, there is a very great, and considerable difference; so as some *Oaken-Timber* proves manifestly weaker, more spongy, and sooner decaying than other: The like may be affirm'd of *Ash*, and other kinds; and generally speaking, the *close grain'd* is the stoutest, and most permanent: But of this, let the industrious consult that whole *tenth Chapter* in the *second Book* of *Vitruvius*, where he expressly treats of this Argument, *De Abiete supernate & infernate, cum Apennini descriptione*: Where we note concerning *Oak*, that it neither prospers in very hot, nor excessive cold Countries; and therefore there is little good of it to be found in *Africa*, or indeed, the lower, and most Southern parts of *Italy* (but the *Venetians* have excellent *Timber*) nor in *Denmark*, or *Norway* comparable to ours; it chiefly affecting a temperate *Climate*, and where they grow naturally in abundance, 'tis a promising mark of it. If I were to make choice of the place, or the Tree, it should be such as grows in the best *Cow-pasture*, or up-land *Meadow*, where the mould is rich, and sweet (*Sussex* affords an admirable instance) and in such places you may also *Transplant* large *Trees* with extraordinary success; And therefore it were not amiss to bore, and search the ground where you intend to plant or sow, before you fall to work;

since Earth too *shallow*, or *rocky* is not so proper for this *Timber*; the *Roots* fix not kindly, and though for a time they may seem to flourish, yet they will dwindle.

5. But to discourage none, *Oaks* prosper exceedingly even in gravel, and moist *clays*, which most other *Trees* abhor; yea, even the coldest *Clay* grounds that will hardly graze: But these *Trees* will frequently make *Stands*, as they encounter variety of footing; and sometimes proceed again vigorously, as they either penetrate beyond, or out-grow their obstructions, and meet better Earth; which is of that consequence, that I dare boldly affirm, more than an *hundred* years advance is clearly gain'd by *Soil* and *Husbandry*. I have yet read, that there grow *Oaks* (some of which have contain'd ten loads apiece) out of the very Walls of *Silcester* in *Hants*shire, which seem to strike root in the very *Stones*; and even in our renowned *Forest* of *Dean* it self, some goodly *Oaks* have been noted to grow upon Ground, which has been as it were a *Rock* of ancient *Cinders*, buried there many ages since. It is indeed observ'd, that *Oaks* which grow in rough *stony* grounds, and obstinate *clays*, are long before they come to any considerable stature; (for such places, and all sort of *Clay*, is held but a *step-mother* to *Trees*) but in time they afford the most excellent *Timber*, having stood long, and got good footing: The same may we affirm of the lightest *sands*, which produces a smoother-grain'd *Timber*, of all other the most useful for the *Joyner*; but that which grows in *Gravel* is subject to be *Frow* (as they term it) and brittle. What improvement the stirring of the ground about the roots of *Oaks* is to the *Trees*, I have already hinted; and yet in *Copses* where they stand warm, and so thick'd with the *under-wood*, as this culture cannot be practis'd, they prove in time to be goodly *Trees*. I have of late tried the *Grafting* of *Oaks*, but as yet with slender success; *Ruellius* indeed affirms it will take the *Pear* and other *Fruit*, and if we may credit the *Poet*,

The sturdy Oak do's Golden Apples bear.

And under *Elmes* swine do the Mast devour.

—Aorta dura
Mala ferant quocum.
Ecl. 8.
Glandemque suis frigere sub Ulmo.
Geor.

Which I conceive to be the more probable, for that the *sap* of the *Oak* is of an unkind tincture to most *Trees*. But for this Improvement, I would rather advise *Inoculation*, as the ordinary *Elm* upon the *Witch-Hazel*, for those large leaves we shall anon mention, and which are so familiar in *France*.

6. That the Transplanting of young *Oaks* gains them *ten* years *Advance*, some happy persons have affirmed: from this belief, if in a former *Impression* I have desir'd to be excused, and produc't my Reasons for it, I shall not persist against any sober mans *Experience*; and therefore leave this *Article* to their choice; since (as the *Butchers* phrase is) change of *Pasture* makes fat *Cattle*; and so *Transplantations* of these hard-wood-trees, when young, may possibly, by an happy hand, in fit season, and other circumstances of *Soil*,

Sun,

Sun, and *Room* for growth, be an improvement: But as for those who advise us to plant *Oaks* of too great a stature, they hardly make any considerable progress in an *Age*, and therefore I cannot encourage it, unless the ground be extraordinarily qualified, or that the *Oak* you would transplant, be not above 6 or 7 foot growth in height: Yet if any be desirous to make *trial* of it, let their *Stems* be of the smoothest, and tenderest *Bark*; for that is ever an indication of *youth*, as well as the paucity of their *Circles*, which in disbranching, and cutting the head off, at *five*, or *six* foot height (a thing, by the way, which the *French* usually spare when they Transplant this *Tree*) may (before you stir their *Roots*) serve for the more certain *Guide*; and then plant them immediately, with as much Earth as will adhere to them, in the place destin'd for their *Station*; abating only the *tap roots*, which is that down-right, and stubby part of the *Roots* (which all *Trees* rais'd of *Seeds* do universally produce) and quickning some of the rest with a sharp *knife* (but sparing the *Fibrous*, which are the main *Suckers* and *Mouths* of all *trees*) spread them in the *foss* or *pit* which hath been prepar'd to receive them. I lay in the *foss*, unless you will rather trench the whole *Field*, which is incomparably the best; and infinitely to be prefer'd before narrow *pits* and holes (as the manner is) in case you plant any number considerable, the Earth being hereby made *loose*, *easier* and *penetrable* for the *Roots*, about which you are to cast that *Mould*, which (in opening of the *Trench*) you took from the *Surface*, and purposely laid apart; because it is sweet, mellow, and better *impregnated*: But in this *Work*, be circumspect never to interr your *Stem* deeper than you found it standing; for profound *burying* very frequently destroys a *Tree*, though an *Error* seldom observ'd: If therefore the *Roots* be sufficiently cover'd to keep the *Body* steady and erect, it is enough; and the not minding of this trifling *Circumstance*, does very much deceive our ordinary *Wood-men*: For most *Roots* covet the *Air* (though that of the *Quercus urbana* least of any, for like the *Æf-culus*

How much to heaven her towering head ascends,
So much towards hell her piercing root extends.

—Quid quantum vertice ad auras
Aethereas, tantum radicem Tartara tendit.

Geo. 2.

And the perfection of *that*, does almost as much concern the propriety of a *Tree*, as of *Man* himself, since *Homo* is but *Arbor inversa*; which prompts me to this *curious*, but important *Advertisement*; That the *Position* be likewise sedulously observ'd.

7. For, the *Southern* parts being more *dilated*, and the *pores* expos'd (as evidently appears in their *Horizontal Sections*) by the constant *Excentricity* of their *Hyperbolical Circles*, being now on the *sudden*, and at such a season converted to the *North*, does *starve*, and destroy more *Trees* (how careful soever men have been in ordering the *Roots*, and preparing the *Ground*) than any other *Accident* whatsoever (neglect of *staking*, and defending from *Cattle* excepted) the importance whereof caused the best of *Poets*, and most experienced, in this *Argument*, giving advice concerning this *Article*, to add.

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The Cardinal points upon the Bark they sign,
And as before it flood, in the same line
Place to warm fourth, or the overbent pole;
Such force has custom, in each tender Soul.

Quintian Cæli regionem in cortice signant,
Ut quo quæque modo steterit, quâ parte calor
Astrinus tulerit, quæ tæga obvertit axi,
Nesciant: Adeo incertis conspiciere multum est.
Geor. li. i.

Which *Monition*, though *Pliny*, and some *others* think good to neglect, or esteem *indifferent*, I can confirm from frequent losses of my own, and by particular *trials*; having sometimes *Transplanted* great trees at *Mid-summer* with success (the *Earth* adhering to the *Roots*) and miscarried in others, where this *Circumstance* only was omitted.

To observe therefore the *Coast*, and side of the *stock* (especially of *Fruit-trees*) is not such a trifle as by some pretended: For if the *Air* be as much the *Mother* or *Nurse*, as *Water* and *Earth*, (as more than probable it is) such blossoming *Plants* as court the motion of the *Meridian Sun*, do as twere evidently point out the advantage they receive by their *position*, by the clearness, politure, and comparative splendor of the *South side*: And the frequent *mossiness* of most *Trees* on the opposite side, does sufficiently note the unkindness of that *Aspect*; and which is most evident in the *bark* of *Oaks*, white, and smooth; The *Trees* growing more kindly on the *South* side of an *Hill*, than those which are expos'd to the *North*, with an hard, dark, rougher, and more mossie *Integument*, as I can now demonstrate in a prodigious coat of it, investing some *Pyracanth*s which I have removed to a *Northern* dripping shade. I have seen (writes a worthy Friend to me on this occasion) whole *Hedge-rows* of *Apples*, and *Pears* that quite perished after that shelter was removed: The good *Husbands* expected the contrary, and that the *Fruit* should improve, as freed from the predations of the *Hedge*; but use and custom made that shelter necessary; and therefore (saith he) a *stock* for a time is the weaker, taken out of a *Thicket*, if it be not well protected from all sudden and fierce invasions either of crude *Air* or *Winds*. Nor let any be deterr'd, if being to remove many *Trees*, he shall esteem it too consumptive of time; for with a *Brush* dipped in any white colour, or *Oaker*, a thousand may be marked as they stand, in a moment; and that once done, the difficulty is over. I have been the larger upon these two *Remarks*, because I find them so *material*, and yet so much neglected.

8. There are other *Rules* concerning the *situation* of *Trees*; the former *Author* commending the *North-east* wind both for the flourishing of the *Tree*, and advantage of the *Timber*; but to my observation in our *Climates*, where those sharp *winds* do rather *flanker* than blow fully opposite upon our *Plantations*, they thrive best; and there are as well other circumstances to be considered, as they respect *Rivers*, and *Marshes* obnoxious to unwholsom and poysonous *Fogs*; *Hills*, and *Seas*, which expose them to the weather; and those *syloisfagi venti*, our cruel, and tedious *Western winds*; all which I leave to Observation, because these *Accidents* do so universally govern, that it is not easie to determine farther than

than that the *Timber* is commonly better qualified which hath endur'd the colder *Aspects* without these prejudices. And hence it is, that *Seneca* observes, *Wood* most expos'd to the *Winds* to be the most *strong* and *solid*, and that therefore *Chiron* made *Achilles's* *Spear* of a *Mountain-tree*; and of those the best, which grow thin, not much shelter'd from the *North*. Again, *Theophrastus* seems to have special regard to *places*; exemplifying in many of *Greece*, which exceeded others for good *Timber*, as doubtless do our *Oaks* in the *Forest of Dean* all others of *England*; and much certainly there may reasonably be attributed to these advantages for the growth of *Timber*, and of almost all other *Trees*, as we daily see by their general improsperity, where the ground is a *hot gravel*, and a loose *earth*: An *Oak*, or *Elme* in such a place shall not in an hundred years, overtake one of fifty planted in its proper *Soil*; though next to this, and (haply) before it, I prefer the good *Air*. But thus have they such vast *Junipers* in *Spain*; and the *Ashes* in some parts of the *Levant* (as of old near *Troy*) so excellent, as it was after mistaken for *Cedar*, so great was the difference; as now the *Cantabrian*, or *Spanish* exceeds any we have elsewhere in *Europe*. And we shall sometimes in our own *Country* see *Woods* within a little of each other, and to all appearance, growing on the same *soil*, where *Oaks* of twenty years growth, or forty, will in the same bulk, contain their double in *Heart* and *Timber*; and that in one, the *Heart* will not be so big as a mans *Arm*, when the *trunk* exceeds a mans *body*: This ought therefore to be weighed, in the first plantation of *Copses*, and a good *Eye* may discern it in the first *shoot*; the difference proceeding doubtless from the variety of the *Seed*, and therefore great care should be had of its goodness, and that it be gather'd from the best sort of *Trees*, as was formerly hinted, c. i.

9. *Veterem Arborem Transplantare* was said of a difficult enterprise; Yet before we take leave off this *Paragraph*, concerning the *Transplanting* of great *Trees*, and to shew what is possible to be effected in this kind, with cost, and industry; Count *Maurice* (the late *Governour* of *Brasill* for the *Hollanders*) planted a *Grove* near his delicious *Paradise* of *Friburge*, containing six hundred *Coco-trees* of eighty years growth, and fifty foot high to the nearest bough: these he waisted upon *Floats*, and *Engines*, four long miles, and planted them so luckily, that they bare abundantly the very first year; as *Casper Barleus* hath related in his elegant *Description* of that *Princes* expedition. Nor hath this only succeeded in the *Indies* alone; *Monsieur de Fiat* (one of the *Marishals* of *France*) hath with huge *Oaks* done the like at *Fiat*. Shall I yet bring you nearer home? A great person in *Devon*, planted *Oaks* as big as twelve *Oxen* could draw, to supply some defect in an *Avenue* to one of his houses; as the Right Honourable the Lord *Fitz-Harding*, late *Treasurer* of his *Majesties* household, assur'd me; who had himself likewise practis'd the *Removing* of great *Oaks* by a particular address extremely ingenious, and worthy the communication.

10. Chuse a *Tree* as big as your *high*, remove the earth from about

bout him; cut through all the *collateral* Roots, till with a competent strength you can enforce him down upon one side, so as to come with your *Axe* at the *Tap-root*; cut *that* off, redress your *Tree*, and so let it stand cover'd about with the *Mould* you loosen'd from it, till the next year, or longer if you think good; then take it up at a fit season; it will likely have drawn new tender *Roots* apt to take, and sufficient for the *Tree*, wherefoever you shall *Transplant* him. *Pliny* notes it as a common thing, to re-establish huge *Trees* which have been blown down, part of their *Roots* torn up, and the body prostrate; and, in particular, of a *Fir*, that when it was to be *Transplanted*, had a *tap-root* which went no less than *eight* cubits perpendicular; and to these I could superadd, but I proceed. To facilitate the *Removal* of such monstrous *Trees*, for the *Adornment* of some particular place, or the rarity of the *Plant*, there is this expedient. A little before the hardest *Frosts* surprize you, make a square *Trench* about your *Tree*, at such distance from the *Stem* as you judge sufficient for the *Root*; dig this of competent depth, so as almost quite to undermine it; by placing *blocks*, and *quarters* of wood, to sustain the *Earth*; this done, cast in as much *Water* as may fill the *Trench*, or at least sufficiently wet it, unless the ground were very moist before. Thus let it stand, till some very hard *Frost* do bind it firmly to the *Roots*, and then convey it to the *pit* prepar'd for its new station, which you may preserve from *freezing*, by laying store of warm *litter* in it, and so close the mould the better to the straggling *Fibers*, placing what you take out about your new guest, to preserve it in temper: But in case the mould about it be so ponderous as not to be remov'd by an ordinary force; you may then raise it with a *Crane*, or *Pully* hanging between a *Triangle*, which is made of three strong, and tall *Limbs* united at the top, where a *Pully* is fastned, as the *Cables* are to be under the quarters which bear the earth about the *Roots*: For by this means you may weigh up, and place the whole weighty *Clod* upon a *Trundle* to be convey'd, and *Replanted* where you please, being let down perpendicularly into the place by the help of the forelaid *Engine*. And by this address you may *Transplant* *Trees* of a wonderful *stature*, without the least disorder; and many times without *topping*, or diminution of the *head*, which is of great importance, where this is practis'd to supply a *Defect*, or remove a *Curiosity*.

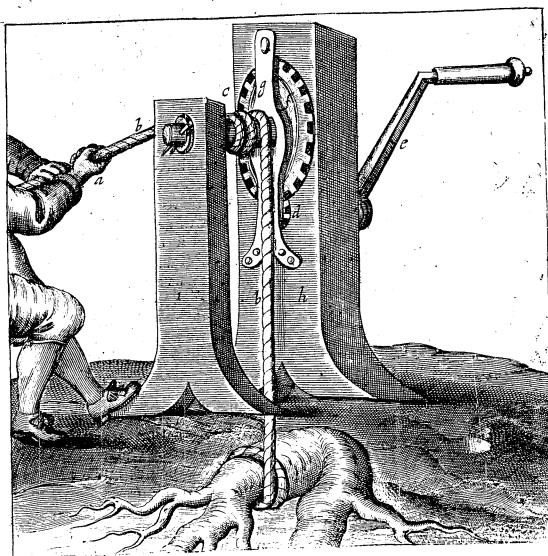
11. Some advise, that in planting of *Oaks*, &c. *four*, or *five*, be suffer'd to stand very near to one another, and then to leave the most *prosperous*, when they find the rest to disturb his growth; but I conceive it were better to plant them at such *distances*, as they may least incommode one another: For *Timber-trees*, I would have none nearer than *forty* foot where they stand *closest*; especially of the spreading kind.

12. Lastly, *Trees* of ordinary stature *Transplanted* (being first well *water'd*) must be sufficiently *staked*, and *Bush'd* about with *thorns*, or with something better, to protect them from the concussions of the *Winds*, and from the casual *rubbing*, and poysonous brutting of *Cattle* and *sheep*, the *cylinefs* of whose *Wooll* is also very

very noxious to them; till being well *grown*, and *fixed* (which by *seven* years will be to some competent degree) they shall be able to withstand all accidental *invasions*, but the *Axe*; for I am now come to their *Pruning* and *Cutting*, in which work the *Seasons* are of main importance.

13. Therefore, if you would propagate *Trees* for *Timber*, cut not off their *heads* at all, nor be too buie with lopping: but if you desire *Shade*, and *Fuel*, or bearing of *Wass* alone, lop off their tops, *sear*, and unthriving *Branches* only; if you intend an out-right *felling*, expect till *November*; for this *premature* cutting down of *Trees* before the *Sap* is perfectly at rest, will be to your exceeding prejudice, by reason of the *Worm*, which will certainly breed in *Timber* which is felled before that period: But in case you cut only for the *Chimney*, you need not be so punctual as to the time; yet for the benefit of what you let stand, observe the *Moons* increase. The *Reason* of these differences, is; because *this* is the best season for the growth of the *Tree* which you do not fell, the other for the *durableness* of the *Timber* which you do: Now that which is to be *burnt* is not so material for *lasting*, as the growth of the *Tree* is considerable for the *Timber*: But of these particulars, more at large in *Cap. 30*.

14. The very *stumps* of *Oak*, especially that part which is dry, and above ground, being well *grubb'd*, is many times worth the pains and charge, for sundry rare, and hard works; and where *Timber* is dear. I could name some who abandoning this to *workmen* for their pains only, when they perceiv'd the great advantage, repented of their *Bargain*, and undertaking it themselves, were gainers above half: I wish only for the expedition of this *Knotty* work, some effectual *Engine* were devised; such as I have been told a *worthy* Person of this *Nation* made use of, by which he was able with *one man*, to perform more than with *twelve Oxen*; and surely, there might be much done by fastning of *Iron hooks* and *fangs* about one *Root*, to extract another; the *hook* chain'd to some portable *Screw* or *Winch*: I say, such an invention might effect wonders, not only for the extirpation of *Roots*, but the prostrating of huge *Trees*: That small *Engine*, which by some is call'd the *German-devil*, reform'd, after this manner, and duely applied, might be very expedient for this purpose, and therefore we have exhibited the following figure, and submit it to improvement.



a, The hand that keeps the Rope b, close upon the Cylinder c, which is moved by a Pinnion of three or four teeth d, which moves a larger Iron Wheel f. e the Handle put upon the Spindle of the Pinnion, to turn it withal.

The whole Frame is let into a bigger piece of Wood, viz. h, being about four foot in length, and one in breadth, and the other end of the Roller or Cylinder, is sustain'd by a lesser block of Wood (i) g, the Plate which holds the Wheel and Pinnion in the larger block. Note,

That the Cylinder may be made of good tough Iron, about four inches in diameter, and fourteen or sixteen inches in length, and the tooth'd Wheel f, of the like stuff, and of a thickness proportionable: the rest is obvious.

But this is to be practis'd only where you design a final extirpation; for some have drawn *suckers* even from an old *stub-root*; but they certainly perish by the *Moss* which invades them, and are very subject to grow rotten. *Pliny* speaks of one *Root*, which took up an intire *Acre* of Ground, and *Theophrastus* describes the *Lycean Plai-*

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was to have spread an hundred foot; if so, the *Argument* may hold good for their growth after the *Tree* is come to its period. They made *Cups* of the *Roots* of *Oak* heretofore, and such a curiosity *Athenens* tells us was carv'd by *Thericles* himself; and there is a way so to tinge *Oak* after long burying and soaking in *Water* (which gives it a wonderful *politure*) as that it has frequently been taken for a course *Ebony*.

15. There is not in nature a thing more obnoxious to *deceit*, than the buying of *Trees* *standing*, upon the reputation of their *Appearance*: to the eye, unless the *Chapman* be extraordinarily judicious; so various are their *hidden*, and conceal'd *Infirmities*, till they be *fell'd*, and *sawn* out: so as if to any thing *applicable*, certainly there is nothing which does more perfectly confirm it, than the most flourishing *out-side* of *Trees*, *Fronti nulla fides*. A *Timber-tree* is a *Merchant Adventurer*, you shall never know what he is worth, till he be *dead*.

16. *Oaks*, are in some places (where the soil is specially qualified) ready to be cut for *Cops* in fourteen years and sooner; I compute from the first *femination*; though it be told as an instance of high encouragement (and as indeed it merits) that a *Lady* in *Northamptonshire* sowed *Acorns*, and liv'd to cut the *Trees* produc'd from them, twice, in two and twenty years; and both as well grown as most are in sixteen or eighteen. This yet is certain, that *Acorns* set in *Hedge-rows*, have in thirty years born a *stem* of a foot diameter. Generally, *Copp*-wood should be cut close, and at such *Intervals* as the growth requires; which being seldom constant, depends much on the *places*, and the *kinds*, the *mould* and the *air*, and for which there are extant particular *Statutes* to direct us, of all which more at large hereafter. *Oak* for *Tan-bark* may be fell'd from *April* to the last of *June*, by a *Statute* in the 1 *Jacobi*.

17. To enumerate now the incomparable *Uses* of this *Wood*, were needless: But so precious was the esteem of it, that of *Old* there was an express *Law* amongst the *Twelve Tables*, concerning the very gathering of the *Acorns*, though they should be found fallen into another mans *Ground*: The *Land* and the *Sea* do sufficiently speak for the improvement of this excellent material; *Houses*, and *Ships*, *Cities*, and *Navies* are built with it; and there is a kind of it so tough, and extremely compact, that our sharpest *Tools* will hardly enter it, and scarcely the very *Fire* itself, in which it consumes but slowly, as seeming to partake of a *ferruginous*, and *metallin* shining nature, proper for sundry robust *Uses*. It is doubtless of all *Timber* hitherto known, the most universally useful and strong; for though some *Trees* be harder, as *Box*, *Cornus*, *Ebony*, and divers of the *Indian Woods*; yet we find them more fragile, and not so well qualified to support great incumbencies and weights, nor is there any *Timber* more *lasting* which way soever us'd. There has (we know) been no little stir amongst Learned men of what material the *Cross* was made, on which our blessed *Saviour* suffer'd: *Venerable Bede* in *Collectaneis*, affirms it to have been fram'd of several *Woods*, namely, *Cypress*, *Cedar*, *Pine*, and *Box*; and to

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confirm it, St. Hierom has cited the 6 of *Isaiah* 13. *Gloria Libani ad te veniet, & Buxus & Pinus simul ad ornandum locum sanctificationis mee, & locum Pedum meorum significabo*; but following the *Version* of the Lxx. he reads in *Cupresso*, *Pinu & Cedro*, &c. others infer the *Palm*, and to compose the *Gibbet* of no less than four different *Timbers*, according to the old verse:

Nail'd were his Feet to Cedar, to Palm his hands;
Cypress his Body bore, Title on Olive stands:

*Quatuor ex lignis Domini Crux dicitur esse, &c.
Pec Crux est Cedrus, Corpus tenet alia Cupressus;
Palma manus retinet, Titulo letatur Oliva.*

And for this of the *Palm*, they fetch it from that of 7. *Cant.* 8. where 'tis said, *Ascendam in Palmam, & apprehendam fructus ejus*, and from other *Allegorical*, and *Mysterious* expressions of the sacred *Text*, without any manner of probability; Whilst by *Alphonsus Giaconus*, *Lipsius*, *Angelus Rocca*, *Falconius*, and divers other learned men (writing on this subject) and upon accurate examination of the many fragments pretended to be parcels of it, 'tis generally concluded to have been the *Oak*, and I do verily believe it; since those who have described those *Countries*, assure us there is no Tree more frequent; which (with relation to several celebrations and *Mysteries* under *Oaks* in the *Old Testament*) has been the subject of many fine discourses. Nor is it likely they should chool, or assemble so many sorts of *Woods* with that curiosity, to execute one upon, whom they esteem'd a Malefactor; besides, we read how heavy it was, which *Cypress*, *Cedar*, and *Palm* are not in comparison with *Oak*, whilst *Grotius* denies all this, *lib. 1. cap. 6.* and concludes upon his accurate examination of several fragments yet extant, that 'tis not discernable of what *Timber* it was fram'd. That which is twin'd, and a little wreathed (easily to be discern'd by the texture of the *Bark*) is best to support *Burthens*, for *Posts*, *Columns*, *Summers*, &c. for all which our *English Oak* is infinitely preferable to the *French*, which is nothing to *useful*, nor comparably so *strong*; inasmuch as I have frequently admir'd at the sudden failing of most goodly *Timber* to the *Eye*, which being employ'd to these *Uses*, does many times most dangerously flie in funder, as wanting that native *spring*, and *toughness*, which our *English Oak* is indu'd withal. And here we forget not the strels which Sir H. Wotton, and other *Architects* put even in the very position of their growth, their native straightness and loftiness, for *Columns*, *Supporters*, *Cross-beams*, &c. and 'tis found that the rough grain'd body of a stubbed *Oak*, is the fittest *Timber* for the *Case* of a *Cider-Mill*, and such like *Engines*, as best enduring the unquietness of a ponderous Rolling-stone. For *Shingles*, *Pales*, *Lathes*, *Coopers wares*, *Clap-board* for *Wainscot*, and some *Pannels*, are curiously vein'd, of much esteem in former times, till the finer grain'd *Spanish*, and *Norway Timber* came amongst us, which is likewise of a whiter colour. There is in *New-England* a certain *Red-Oak*, which being fell'd, they season in some moist, and muddy place, which branches into very curious works. It is observ'd that *Oak* will not easily

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glue to other *Wood*; no not very well with its own kind; and some sorts will never cohere tolerably, as the *Box* and *Horn-beam*, though both hard woods; so nor *Service* with *Cornell*, &c. *Oak* is excellent for *Wheel-spokes*, *Pinns* and *Peggs* for *Tysling*, &c. Mr. *Blith* makes *Sparrs*, and small building-timber of *Oaks* of eleven years growth, which is a prodigious advance, &c. the smallest, and straightest is best; discover'd by the upright tenor of the *Bark*, as being the most proper for cleaving: The knottiest for *Water-works*, *Piles* and the like; because 'twill drive best, and last longest; the crooked, yet firm, for *knee-timber* in *Shipping*, *Mill-wheels*, &c. Were planting of these *Woods* more in use, we should banish our *hoops* of *Hazel*, &c. for those of good copse-*Oak*, which being made of the younger shoots, are exceeding tough and strong: One of them being of *Ground-Oak*, will outlast six of the best *Ash*; but this our *Coopers* love not to hear of, who work by the great for *sale*, and for others. The smaller truncheons, and *sprays*, make *Billet*, *Bavine* and *Coals*; and the *Bark* is of price with the *Tanner* and *Dyer*, to whom the very *saw-dust* is of use, as are the *Ashes* and *Lee* for *backing* Linnen, and to cure the *roapishness* of *Wine*: And 'tis probable the *Cups* of our *Acorns* would tan *Leather* as well as the *Bark*, I wonder nobody makes the experiment. The *Ground-Oak* while young, is us'd for *Poles*, *Cudgels* and *walking-staffs*, much come into mode of late, but to the wast of many a hopeful *Plant* which might have prov'd good *Timber*; and I the rather declaim against the Custom, because I suspect they are such as are for the most part cut, and stolen by idle Persons, and brought up to *London* in great bundles, without the knowledge or leave of the *Owners*, who would never have glean'd their *Copses* for such trifling uses: Here I am again to give a general notice of the peculiar excellency of the *Roots* of most *Trees*, for fair, beautiful, *chamleted*, and lasting *Timber*, applicable to many purposes; such as formerly made *Hasts* for *Daggers*, *Hangers*, *Knives*, *Handles* for *staves*, *Tobacco-Boxes*, and elegant *Joiners-work*, and even for some *Mathematical Instruments* of the larger size, to be had either in, or near the *Roots* of many *Trees*; however 'tis a kindness to premonish *Stewards* and *Surveyors*, that they do not negligently waste those materials: Nor may we here omit to mention the *Galls*, *Mistletoe*, *Polypod*, *Agaric* (us'd in *Antidotes*) *Uvae*, *Fungus* to make *Tinder*, and many other useful *Excrecencies*, to the number of above twenty, which doubtless discover the variety of *transudations*, *percolations* and *contextures* of this admirable *Tree*; but of the several *Fruits*, and *Animals* generated of them, and other *Trees*, *Francisco Redi* promises an express Treatise, in his *Esperienze intorno alla Generatione de gl'Insetti*, already publish'd. *Pliny* affirms that the *Galls* break out altogether in one night about the beginning of *June*, and arrive to their full growth in one day; this I recommend to the experience of some extraordinary vigilant *Wood-man*. *Galls* are of several kinds, but grow upon a different species of *Robur* from any of ours, which never arrive to any maturity; the *white* and imper-

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Vide Joh. de Choul, De var. na. Quercus hispanica.

forated are the best. What benefit the *Mast* does universally yield for the fattening of *Hogs* and *Deer*, I shall shew upon another occasion, before the conclusion of this Discourse. A Peck of *Acorns* a day, with a little *Bran*, will make an *Hog* ('tis said) increase a pound-weight *per diem* for two months together. They give them also to *Oxen* mingled with *Bran*, chop'd or broken; otherwise they are apt to sprout, and grow in their bellies. Others say, they should first be macerated in *water*, to extract their malignity, *cattell* many times perishing without this preparation. *Cato* advises the *Husband-man* to reserve 240 bushels of *Acorns* for his *Oxen*, mingled with a like quantity of *Beans* and *Lupines*, and to drench them well. But in truth they are more proper for *swine*, and being so made small, will fatten *Pigeons*, *Peacocks*, *Turkies*, *Pheasants*, and *Poultry*; nay 'tis reported, that some *Fishes* feed on them, especially the *Tunny*, in such places of the coast where *trees* hang over Arms of the *Sea*. *Acorns* were heretofore the food of *Men*, nay of *Jupiter* himself, (as well as other productions of the Earth) till their luxurious palats were debauched: and even in the *Romans* time, the custom was in *Spain* to make a second service of *Acorns* and *Mast*, (as the *French* now do of *Marrons* and *Chestnuts*) which they likewise used to roast under the embers.

— Fed with the Oaken Mast
The aged Trees themselves in years surpass'd.

— Et quænam glande repasta
Æquasse annosæ vivendo corpora Quercus.

And men had indeed hearts of Oak; I mean, not so hard, but health, and strength, and liv'd naturally, and with things easily parable and plain.

Elest Age o'th' world, just Nymph, when *Mau* did dwell
Under thy shade, whence his provision fell;
Salads the *meal*, *Wildings* were the *Dessert*;
No Tree yet learn'd by ill-exempl'd Art
With iniquitious fruit to symbolize,
As in an Emblem, our Adulteries.

Chim dabat umbra domum vivamtuas, chim damus ipsa
Decidua Dominos pascibat fruge quistos,
Solaque præbebant Sylvæstria poma secundas
Graminis opulas mensis; nondum arte magistra
Avisor Adulteris prælosoant iustia nostris, &c.
Coulcei Pl. L. 6.

as the sweet *Poet* bespeaks the *Dryad*; But 'tis in another place where I shew you what this *Acorn* was; and even now I am told, that those small young *Acorns* which we find in the *Stock-doves* Crows, are a delicious fare, as well as those incomparable *Salads* of young herbs taken out of the *maws* of *Partridges* at a certain season of the year, which gives them a preparation far exceeding all the art of *Cookery*. *Oaks* bear also a *knur*, full of a cottony matter, of which they anciently made *Wick* for their *Lamps* and *Candles*; and among the *selectiora Remedia* of *Jo. Prevotius*, there is mention of an Oil è *querna glande* Chymically extracted, which he affirms to be of the longest continuance, and least consumptive of any other whatsoever for such lights, ita ut uncia singulis mensibus vix absumatur continuo igne. The leaves of *Oaks* abundantly congested on *snow*, preserves it as well for *wine*, as a deep *pit*, or the most artificial Refrigeratory. *Varro* affirms, they made *Salt* of *Oak* althes, with which they sometimes seasoned *meat*, but more frequently

quently made use of it to sprinkle among, and fertilize their seed-corn: which minds me of a certain *Oak* found buried somewhere in *Transylvania*, near the *salt-pits*, that was intirely converted into an hard salt, when they came to examine it by cutting. This experiment (if true) may possibly encourage some other attempts for the multiplying of *Salt*. Of the *Galls* is made the ground and basts of *Inks* and several *Dyes*, especially sadder colours, and are a great revenue to those who have quantities of them. The very *Atop* of the *Oak*, viz. that which is white, composes the choicest *Cypress-powder*, which is esteemed good for the head: but *Impostors* familiarly vend other *Mosses* under that name, as they do the *Fungi* for the true *Agaric*, to the great scandal of *Physick*. Young red *Oaken* leaves decocted in *wine*, make an excellent gargle for a sore month; and almost every part of this Tree is sovereign against *Fluxes* in general. The dew that impearls the leaves in *May*, insulated, meteorizes and sends up a liquor, which is of admirable effect in *Ruptures*: And a water distill'd from the *Acorns* is good against the *Pithick*, *Stitch* in the side, and heals inward *Ulcers*, breaks the *Stone*, and refrigerates *Inflammations*, being applied with *Linne* dip'd therein: nay, the *Acorns* themselves eaten fasting, kill the worms, provoke *urine*, and (some affirm) break even the *Stone* itself. The *Coals* of *Oak* beaten and mingled with *honey*, cures the *Carbuncles*; to lay nothing of the *Viscen's*, *Polypods*, and other *Excrescences*, of which innumerable Remedies are composed, noble *Antidotes*, *Syrups*, &c. Nay, 'tis reported, that the very shade of this tree is so wholesome, that the sleeping, or lying under it becomes a present remedy to *Paralyticks*, and recovers those whom the mistaken malign influence of the *Walnut-tree* has smitten: nay I read in one *Paulus a Physician* of *Denmark*, That an handful or two of small *Oak* buttons, mingled with *Oats*, given to *Horses* which are black of colour, will in few days eating alter it to a fine *Dapple-grey*, which he attributes to the *Vitriol* abounding in this Tree. To conclude, and upon serious meditation of the various uses of this, and other trees, we cannot but take notice of the admirable Mechanism of Vegetables in general, as in particular in this species; that by the diversity of *Percolations* and *Strainers*, and by mixtures as it were of divine Chymistry, various concoctions, &c. the sap should be so green on the indented leaves, so lustily esculent for our hardier, and rustick Constitutions in the fruit; so flat and pallid in the *Atramental Galls*; and haply, so prognostick in the *Apple*; so *Suberos* in the *Bark* (for even the *Cork-tree* is but a courser *Oak*) so *Oozie* in the *Tanners pit*; and in that subduction so wonderfully specifick in corroborating the *Entrails*, and *Bladder*, *Reins*, *Loins*, *Back*, &c. which are all but the gifts and qualities, with many more, that these robust sons of the Earth afford us; and that in other specifics, even the most despicable and vulgar *Elder* imparts to us in its rind, leaves, buds, blossoms, berries, ears, pith, bark, &c. Which hint may also carry our remarks upon all the varieties of shape, Leaf, Seed, Fruit, Timber, Grain, Colour, and all those other forms that Philosophers have enumerated;

but

but which were here too injurious for us to repeat. Let us end with the Poet:

When Ships for blousy combat we prepare,
Oak affords plank, and arms our Men of War;
Mainmains our fires, makes plows to till the ground,
For use no Timber like the Oak is found.

Si quando armande naves, & bella parandæ,
Det quercus nautis tabulata, det arma furoris
Bellantum; det ligna focæ, det aratra colono,
Aut aliis aliis porro sumatur in usus.

Rapinus.

CHAP. IV.

Of the Elm.

Elm.

1. **U**LMUS the Elm, There are four, or five sorts, and from the difference of the Soil and Air divers *spurious*: Two of these kinds are most worthy our culture, the vulgar, viz. the Mountain Elm, which is taken to be the *Oripetea* of Theophrastus; being of a less jagged and smaller leaf; and the Vernacular or French Elm, whose leaves are thicker, and more florid, glabrous and smooth, delighting in the lower and moister grounds, where they will sometimes rise to above an hundred foot in height, and a prodigious growth, in less than an Age; my self having seen one planted by the hand of a Countess yet living, which near twelve foot in compass, and of an height proportionable; notwithstanding the numerous progeny which grows under the shade of it, some whereof are at least a foot in Diameter, that for want of being seasonably transplanted, must needs have hindered the procerity of their ample and indulgent Mother: I am persuaded some of these are *Viviradices*, & *Traduces* product of the falling seeds.

2. For though both these sorts are rais'd of *Appendices*, or *Suckers* (as anon we shall describe) yet this latter comes well from the *Samara* or *Seeds*, and therefore I suppose it to be the ancient *Attinea*, for such an Elm they acknowledge to be rais'd of *Seeds*, which being ripe about the beginning of March (though frequently not till the following Month) will produce them; as we see abundantly in the Gardens of the *Thuyleries*, and that of *Luxembourg*, at Paris, where they usually sow themselves and come up very thick; and so do they in many places of our Country, though so seldom taken notice of, as that it is esteem'd a *fable*, by the less observant and ignorant vulgar; let it be tried in *season*, by turning and raking some fine earth, often refreshed, under some amply spreading Tree, or to raise them of their *Seeds* (being well dried a day or two before) sprinkled in *Beds* prepar'd of good loamy fresh earth, and sifting some of the finest mould thinly over them, and watering them when need requires. Being risen (which may be within 4 or 5 months) an inch above ground (refreshed, and preserved from the scraping of *Birds* and *Poultry*) comfort the tender

der seedlings by a second sifting of more fine earth, to establish them; thus keep them clean weeded for the first two years, and cleaning the side-boughs; or till being of fitting stature to remove into a Nursery at wider intervals, and even rows, you may thin, and Transplant them in the same manner as you were directed for young Oaks; only they shall not need above one cutting, where they grow less regular and hopeful. But because this is an Experiment of some curiosity, obnoxious to many casualties, and that the producing them from the Mother-roots of greater Trees is very facile and expeditious (besides the numbers which are to be found in the Hedge-rows, and Woods, of all plantable sizes) I rather advise our Forester to furnish himself from those places.

3. The Suckers which I speak of are produced in abundance from the Roots, whence, being dextrously separated, after the Earth has been well loosed, and planted about the end of October, they will grow very well: Nay, the stubs only, which are left in the ground after a felling (being fenced in as far as the Roots extend) will furnish you with plenty, which may be transplanted from the first year or two, successively, by slipping them from the Roots, which will continually supply you for many years, after that the body of the Mother-tree has been cut down: And from hence probably is sprung that (I fear) mistake of *salmasius* and others, where they write of the growing of their *Chips* (I suppose having some of the Bark on) scattered in hewing of their Timber; the Error proceeding from this, that after an Elm-tree has been fell'd, the numerous Suckers which shoot from the remainders of the latent Roots, seem to be produced from this dispersion of the Chips: Let this yet be more accurately examined; for I pronounce nothing *Magisterially*, since it is so confidently reported.

4. I have known stakes sharpened at the ends for other purposes, take root familiarly in moist grounds, and become Trees; and divers have essay'd with extraordinary success the trunchions of the Boughs and Arms of Elms cut to the scantling of a mans arm, about an ell in length. These must be chop'd on each side opposite, and laid into trenches about half a foot deep, covered about two or three fingers deep with good mould. The season for this work is towards the exit of January, or early in February if the Frosts impede not, and after the first year, you may cut, or saw the trunchions off in as many places as you find cause, and as the shoots and rooted Sprouts will direct you, for transplantation. Another expedient for the propagation of Elms is this; let trencher be sunk at a good distance (viz. twenty, or thirty yards) from such Trees as stand in Hedge-rows, and in such order as you desire your Elms should grow; where these gutters are, many young Elms will spring from the small roots of the adjoining Trees. Divide (after one year) the shoots from their Mother-roots, which you may dextrously do with a sharp spade: These transplanted, will prove good Trees without any damage to their Progenitors. Or do thus, Lop a young Elm, the lop being about three

three years growth, do it in the latter end of *March*, when the *Sap* begins to creep up into the Boughs, and the *Buds* ready to break out; cut the Boughs into lengths of four foot flanting, leaving the *knot* where the *end* seems to put forth in the middle: Inter these short pieces in *trenches* of three or four inches deep, and in good *mould* well trodden, and they will infallibly produce you a Crop, for even the smallest *suckers* of *Elms* will grow being set when the *sap* is newly stirring in them. There is yet a fourth way no less expeditious, and frequently confirmed with excellent success: *Bare* some of the *Maister-roots* of a vigorous *Tree* within a foot of the *Trunk*, or thereabouts, and with your *Axe* make several Chops, putting a small stone into every cleft, to hinder their closure, and give access to the *wet*; then cover them with three, or four *inch* thick of Earth; and thus they will send forth *Suckers* in abundance (I assure you one single *Elm* thus well ordered, is a fair *Nursery*) which after two or three years, you may separate and plant in the *Ulmarium*, or place designed for them; and which if it be in *Plumps* (as they call them) within ten or twelve foot of each other, or in *Hedge-rows*, it will be the better: For the *Elm* is a Tree of *Consort*, *Sociable*, and so affecting to grow in Company, that the very best which I have ever seen, do almost touch one another: This also protects them from the *Winds*, and causes them to shoot of an extraordinary height; so as in little more than *forty years*, they even arrive to a load of *Timber*, provided they be sedulously and carefully cultivated, and the *Soil* propitious. For an *Elm* does not thrive so well in the *Forest*, as where it may enjoy scope for the *Roots* to dilate and spread at the sides, as in *Hedge-rows* and *Avenues*, where they have the *Air* likewise free: note, that they do properly by *Layers* also.

5. There is besides these sorts we have named, one of a more *Scabrous* harsh leaf, but very large, which becomes an huge *Tree*, and is distinguished by the name of the *Witch-hazel* in our *Statute Books*, as serving formerly to make *long Bowes* of; but the *Timber* is not so good as the *first* more vulgar; but the *Bark* at time of year, will serve to make a course *bast-rop* with.

6. Of all the *Trees* which grow in our *Woods*, there is none which does better suffer the *Transplantation* than the *Elm*; for you may remove a *Tree* of *twenty years* growth with undoubted success: It is an Experiment I have made in a *Tree* almost as big more as my waste; but then you must totally *disbranch* him leaving only the *Summit* intire; and being careful to take him up with as much *Earth* as you can, refresh him with abundance of *water*. This is an excellent, and expeditious way for great Persons to plant the *Accesses* of their Houses with; for being disposed at sixteen, or eighteen foot *interval*, they will in a few years bear goodly heads, and thrive to admiration. Some that are very cautious, emplaster the wounded head of such over-grown *Elms* with a mixture of *clay* and *horse-dung*, bound about them with a wisp of *Hay* or fine *Moss*, and I do not reprove it, provided they take care

care to temper it well, so as the *Vermine* nestle not in it. But for more ordinary plantations, younger *Trees*, which have their *bark* smooth and tender, clear of *Wens* and *Tuberous* bunches (for those of that sort seldom come to be stately *Trees*) about the scantling of your leg, and their heads trimm'd at five or six foot height, are to be prefer'd before all other. *Cato* would have none of these sorts of *Trees* to be removed till they are five or six fingers in *diameter*; others think they cannot take them too young; but experience (the best *Mistress*) tells us, that you can hardly plant an *Elm* too big. There are who pare away the *Root* within two fingers of the *stem*, and quite cut off the *Head*; but I cannot commend this extrem severity, no more than I do the strewing of *Oats* in the pit; which fermenting with the moisture, and frequent waterings, is believed much to accelerate the putting forth of the *Roots*; not considering, that for want of *air* they corrupt, and grow musty, which more frequently suffocates the *Roots*, and endangers the whole *Tree*.

7. I have affirmed how patient this *Tree* is of *Transplantation*; not only for that I observe so few of them to grow wild in *England*, and where it may not be suspected, but they, or their predecessors have been planted by some industrious hand; but for that those incomparable *Walks*, and *Vistas* of them both at *Aranuez*, *Casa del Campo*, *Madrid*. the *Escorial*, and other places of delight belonging to the *King*, and *Grandees* of *Spain*, are planted with such as they report *Philip the Second* caused to be brought out of *England*; before which (as that most Honourable Person the Earl of *Sandwich*, lately his Majesties Ambassador Extraordinary at that *Court* writ to me) it does not appear there were any of those *Trees* in all *Spain*. In that Princely Seat it is, that double rows of them are planted in many places for a *league* together in length, and some of them *fourty yards* high, which are kept stripe up to the very top branch, which must needs render a most glorious, and agreeable effect; no *Tree* whatsoever, becoming long *Walks* and *Avenues*, comparably to this Majestick plant: But hear it as sweetly advised as described;

An *Elm* for graceful verdure, bushy bough,
A lofty top, and a firm rind allow.
Plant *Elm* in borders, on the Grass-plots list,
Branches of *Elm* into thick arbours twist;
A Gallery of *Elm* draw to the end
That Eyes can reach, or a breath'd race extend.

Ut visor sit ulmo lætas, ramique comantes,
Arduus, alta petens & lævi corice truncus.
Ulmum adhibet ordinibus, quoties fundenda per hortum,
Sunt serie spatia ingenti, texendaque totis,
Æstivos contra soles umbracula campis:
Osa alias inter texendis optior ulmus
Marginebus florum, exorandoque viroto.
Stique adeo series, plenis super aquas, tendat
Ulmorum tractis longæ, quantum ipse tantum
Lumina, vel grossas valeant intrare sequentes.
Rapinus.

8. The *Elm* delights in a *sound, sweet, and fertile Land*, something more inclined to *Loamy* moisture, and where good pasture is produced; though it will also prosper in the gravelly, provided there be a competent depth of *mould*, and be refreshed with *Springs*; in defect of which, being planted on the very surface of the ground (the *swarth* par'd first away, and the earth stirred a foot

deep or more) they will undoubtedly succeed; but in this *trial*, let the *Roots* be handſomly ſpread, and covered a *foot*, or more in height, and above all, firmly ſtaked. This is practicable alſo in other *Trees*, where the Soil is over moiſt, or unkind: For as the *Elm* does not thrive in too *dry*, *fandy*, or *hot* grounds, no more will it abide the *cold* and *ſpongy*; but in places that are competently fertile, or a little elevated from theſe annoyances; as we ſee in the *Mounds*, and caſting up of *Ditches*, upon whole banks the *Female* root does more naturally delight; though it ſeems to be ſo much more addiſted to ſome places than to others, that I have frequently doubted, whether it be a pure *Indigene* or *translaticion*; and not only becauſe I have hardly ever known any conſiderable *Woods* of them (beſides ſome few *Nurseries* near *Cambridge*, planted I ſuppoſe for ſtore) but almoſt continually in *Tufts*, *Hedge-rows*, and *Mounds*; and that *Shropſhire*, and ſeveral other Counties, have rarely, any growing in many miles together.

9. The *Elm* is by reaſon of its aſpiring, and tapering growth (unleſs it be topped to enlarge the *Branches*, and make them ſpread low) the leaſt offenſive to Corn and *Paſture grounds*, to both which, and the *Cattel*, they afford a benign *ſhade*, *defence*, and agreeable *Ornament*.

10. It would be planted as *ſhallow* as might be; for, as we noted, deep *interring* of *Roots* is amongſt the *Catholick* miſtakes; and of this, the greateſt to which *Trees* are obnoxious. Let new planted *Elms* be kept moiſt by frequent reſreſhings upon ſome half-rotten *Fern*, or *Littier* laid about the foot of the *ſtem*; the earth a little ſtirred and depreſſed for the better reception, and retention of the *Water*.

11. Laſtly, your Plantation muſt above all things, be carefully preſerved from *Cattel*, and the concuſſions of impetuous *Winds*, till they are out of reach of the *one*, and ſturdy enough to encounter the *other*.

12. When you lop the ſide-boughs of an *Elm* (which may be about *January* for the *Fire*, and more frequently, if you deſire to have them *ſall*; or that you would form them into *Hedges* (for ſo they may be kept *plaſhed*, and thickned to the higheſt twig; affording both a magnificent, and auſtful defence againſt the *Winds* and *Sun*) I ſay, when you trim them, be careful to indulge the *tops*; for they protect the *body* of your *Trees* from the *wet*, which always invades thoſe parts firſt, and will in time *periſh* them to the very heart; ſo as *Elms* beginning thus to decay, are not long proſperous. Sir *Hugh Plat* relates (as from an expert *Carpenter*) that the boughs and branches of an *Elm* ſhould be left a foot long next the *trunk* when they are *lop'd*; but this is to my certain obſervation, a very great miſtake either in the *Relator*, or *Author*; for I have noted many *Elms* ſo diſbranched, that the remaining *ſtubs* grew immediately *hollow*, and were as ſo many *Conduits* or *Pipes*, to hold, and convey the *Rain* to the very *body* and *heart* of the *Tree*.

13. There

13. There is a *Cloſſet* of the right *French Elms* in the little *Garden* near to her *Majeſties* the Queen *Mothers* Chapel at *Somerſet-houſe*, which were (I ſuppoſe) planted *there*, by the induſtry of the *F. F. Capuchines*, that will perfectly direct you to the incomparable uſe of this noble *Tree* for *ſhade* and *delight*, into whatever *figure* you will accuſtom them. I have my ſelf procured ſome of them from *Paris*, but they were ſo abuſed in the *Transportation*, that they all periſhed ſave *one*, which now flouriſhes with me: I have alſo lately improved *Elms* to a great improvement of their heads: *Virgil* tells us they will joyn in *Marriage* with the *Oak*, and they would both be tryed; and that with the more probable ſucceſs, for ſuch *lignous* kinds, if you *graft* under the Earth, upon, or near the very *Root* it ſelf, which is likely to entertain the *Cyon* better than when more expoſed, till it be well fixt; and have made ſome conſiderable progrels.

14. When you would *Fell*, let the *Sap* be perfectly in *reſpoſe*; as 'tis commonly about *November* or *December*, after the *froſt* hath well nipp'd them: I have already alledged my reaſon for it; and I am told, that both *Oak* and *Elm* ſo cut, the very *ſaplings* (whereof *Raſiers*, *Sparis*, &c. are made) will continue as long as the very *heart* of the *Tree*, without decay. In this work, cut your *kerſe* near to the ground; but have a care that it ſuffer not in the *fall*, and be ruined with its own weight: This depends upon your *Wood-mans* judgment in *diſbranching*, and is a neceſſary caution to the *Felling* of all other *Timber-trees*. If any begin to *doat*, pick out ſuch for the *Axe*, and rather truſt to its *ſucceſſor*.

15. *Elm*, is a *Timber* of moſt ſingular uſe; eſpecially where it may lie continually *dry*, or *wet*, in *extreams*; therefore proper for *Water-works*, *Mills*, the *Ladles*, and *Soles* of the *Wheel*, *Pipes*, *Pumps*, *Aque-ducs*, *Pales*, *Ship-planks* beneath the *Water-line*; and ſome that has been found buried in *Bogs* has turned like the moſt poliſh'd, and hardeſt *Ebony*, only diſcerned by the grain: Alſo for *Wheel-wrights*, *Handles* for the ſingle *Hand-ſaw*, the knotty for *Naves*, *Hubs*, the ſtraight and ſmooth for *Axle-trees*, and the very *Roots* for curiouſly dappled works, ſcarce has any ſuperior for *Kerbs* of *Coppers*, *Featherbeds*, and *Weather-boards*, (but it does not without difficulty, admit the *nail* without *boring*) *Chopping-blocks*, *Blocks* for the *Hat-maker*, *Trunks*, and *Boxes* to be covered with *leather*; *Coffins*, for *Dreſſers*, and *Showelboard-Tables* of great length, and a lultrous Colour if rightly ſeaſoned; alſo for the *Carver*; by reaſon of the tenor of the grain, and toughneſs which fits it for all thoſe curious works of *Frontages*, *Foliage*, *Shields*, *Statues*, and moſt of the *Ornaments* appertaining to the *Orders* of *Architecture*, and for not being much ſubject to warping; I find that of old they uſed it even for *hinges* and *books* of *Doors*; but then, that part of the *Plank*, which grew towards the top of the *Tree*, was in work to be always reverſed; and for that it is not ſo ſubject to riſt, *Vitruius* commands it both for *Tenons* and *Mortaiſes*: But beſides theſe;

and sundry other employments, it makes also the second sort of *Charcoal*; and finally (which I must not omit) the use of the very *leaves* of this *Tree*, especially of the *female*, is not to be despis'd; for being suffered to dry in the *sun* upon the *Branches*, and the *spray* strip'd off about the *decrease* in *August* (as also where the *suckers* and *stolones* are super-numerary, and hinder the thriving of their *Nurses*) they will prove a great relief to *Cattel* in *Winter*, and scorching *Summers*, when *Hay* and *fodder* is dear; they will eat them before *Oates*, and thrive exceedingly well with them; remember only to lay your *Boughs* up in some dry, and sweet corner of your *Barn*: It was for this the *Poet* prais'd them, and the *Epithete* was advis'd,

Fruitful in leaves the Elm.

—*Secunde frondibus Ulmi.*
Georg. 2.

In some parts of *Herefordshire* they gather them in *sacks* for their *Swine*, and other *Cattel* according to this Husbandry. But I hear an ill report of them for *Bees*, that surfeiting of the blooming *Seeds*, they are obnoxious to the *Lark*, at their first going abroad in *Spring*, which endangers whole *Stocks*, if *Remedies* be not timely adhibited; therefore 'tis said in great *Elm* Countries they do not thrive, but the truth of which I am yet to learn. The *Green* leaf of the *Elms* contused, heals a *green wound* or *Cut*, and boyled with the *Bark* consolidates fractur'd *bones*. All the parts of this *Tree* are *abstersive*, and therefore sovereign for the consolidating *wounds*; and assuage the pains of the *Gout*: But the *Bark* decocted in common water to almost the Consistence of a *Syrup*, adding a third part of *Aqua Vita*, is a most admirable Remedy for the *Ischiadica* or *Hip-pain*, the place being well rub'd and chaf'd by the fire.

CHAP.

CHAP. V.

Of the Beech.

1. **T**HE *Beech*, [*Fagus*] (of two or three kinds) and num- *Beech*.
bred amongst the glandiferous Trees, I rank here before
the martial *Ash*, because it commonly grows to a greater stature.
But here I may not omit a Note of the accurate *Critic Palmerius*,
upon a passage in *Theophrastus*, where he *Animadverts* upon his *Interpreter*, and shews that the ancient *ovyd*: was by no means the
Beech, but a kind of *Oak*; for that the figure of the *fruit* is so
widely unlike it; that being round, *this* triangular; and both *The-*
ophrastus and *Pausanias* make it indeed a Species of *Oak*, wholly
differing in *Trunk*, as well as *Fruit* and *Leaf*, to which he adds
(what determines the Controversie) *Εἰς αὐτὴν ἰσχυροτέρου ἔσθλας*,
scilicet, &c. That it is of a firmer *Timber*, not obnoxious to the
Worm, neither of which can so confidently be said of the *Beech*.
Yet *La Cerda* too seems guilty of the same mistake: But leaving
this, there are of our *Fagi*, two or three kinds with us; the
Mountain (where it most affects to grow) which is the whitest, and
most sought after by the *Turners*; and the *Campestral* or wild, which
is of a blacker colour, and more durable. They are both to be
rais'd from the *Mast*, and govern'd like the *Oak* (of which amply)
and that is absolutely the best way of furnishing a *Wood*: unless
you will make a *Nursery*, and then you are to treat the *Mast* as
you are instructed in the *Chapter* of *Ashes*, sowing them in *Autumn*,
or later, even after *January* or rather nearer the *Spring*, to preserve
them from *Vermins* which are very great devourers of them. But
they are likewise to be planted of young *seedlings*, to be drawn
out of the places where the fruitful Trees abound. In transplanting
them cut off only the boughs and bruised parts, two *Inches* from
the *stem*, to within a yard of the *top*; but be very sparing of the
Root: This, for such as are of pretty *stature*. They make spread-
ing Trees, and noble *Shades* with their well furnished and glister-
ing *leaves*, being set at forty foot distance; but they grow taller,
and more upright in the *Forests*, where I have beheld them at *eight*
and *ten* foot, shoot into very long *Poles*; but neither so apt for
Timber, nor *Fuel*: In the *Vallies* (where they stand warm and in
Consort) they will grow to a stupendious *procerity*, though the
soyl be stony and very barren: Also upon the *declivities*, fides,
and tops of high *Hills*, and *Chalkie Mountains* especially; for
they will strangely insinuate their *roots* into the bowels of those
seemingly impenetrable places, not much unlike the *Fir* it self,
which, with *this* so common Tree, the great *Cesar* denies to be
found in *Britanny*, *Materia cujusque generis, ut in Gallia. præ-*
ter Fagum & Abietem: But certainly from a grand mistake, or
rather,

Excerpt in
Theophrast. l. 3.
c. 9.

In Arcad.

rather, that he had not travelled much up into the Country. *Virgil* reports it will graft with the *Chestnut*.

2. The *Beech* serves for various Uses of the Housewife;

Hence in the Worlds best years the humble *Shed*,
Was happily, and fully furnished:

Beech made their *Closets*, their *Nest* and the *Joy'd*-
Beech made the *Boards*, the *Platters*, and the *Bowls*.

Hinc olim juvenis Mundum molibus anis,
Furnaturarum domum non magna Supplex
Tota petebatur; Stellas, Armenta, Lictas,
Et Menfas dabat, & Lances, & Pucula Fagus, &c.

Coultij Pl. l. 6.

with it the *Turner* makes *Dishes*, *Trays*, *Rimbs* for *Buckets*, and other Utensils, *Trenchers*, *Dresser-boards*, &c. likewise for the *Wheeler*, *Joyner*, for large *Screws* and *Upholster* for *seelyes*, *Chairs*, *Stools*, *Bedsteads*, &c. for the *Bellows-maker*, and *Husbandman* his *Shovel* and *Spade-graffs*; *Floater* for *Fishers* *Nets* instead of *Corks*, is made of its *Bark*; for *Fuel*, *Billet*, *Bavin* and *Coal* though one of the least lasting: Not to omit even the very *Shavings* for the fining of *Wines*. *Peter Crescensius* writes, that the *Ashes* of *Beech* with proper mixture, is excellent to make *Glass* with. If the *Timber* lie altogether under *water*, 'tis little inferior to *Elm*, as I find it practised, and asserted by *Shipwrights*: Of old they made their *Vasa Vendemiatoria* and *Corbes Messoriae* (as we our pots for *Strawberries*) with the *Rind* of this *Beech*, nay, and Vessels to preserve *Wine* in, and that curiously wrought *Cup* which the *Shepherd* in the *Bucholicks* wagers withal, was engraven by *Alcimedon* upon the *Bark* of this tree: And an happy age it seems:

— No Wars did men molest,
When only Beechen-Bowles were in request.

— nec bella fuerunt,
Faginus astat dum Scythi ante aperes.

Tibul.

Of the thin *Lamina*, or *Scale* of this wood (as our *Cutlers* call it) are made *Scabards* for *Swords*, and *Band-boxes*, superinduc'd with thin *leather* or *Paper*, *Boxes* for *writings*, *Hat-cases*, and formerly *Book covers*. I wonder we cannot *split* it our selves, but send into other *Countries* for such trifles. In the *Cavities* of these *Trees*, *Bees* much delight to *Hive* themselves: Yet for all this, you would not wonder to hear me deplore the so frequent use of this *Wood*, if you did consider that the industry of *France* furnishes that Country for all domestick *Utensils* with excellent *Walnut*; a material infinitely preferable to the best *Beech*, which is indeed good only for *shade* and for *fire*, as being brittle, and exceedingly obnoxious to the *Worm*, where it lies either *dry*, or *wet* and *dry*, as has been noted; but being putten days in *water*, it will exceedingly resist the *morm*. *Ricciolus* much commends it for *Oars*, and some say that the vast *Argo* was built of the *Fagus*, a good part of it at least, as we learn out of *Apollonius*; this will admit of Interpretation; the *Fagus* yet by *Claudian* is mentioned with the *Alder*,

Sic qui vetulus longinqua per aquora merces
Molitur tellure ratem, vitamque procellis
Obsecrare parat, Fagos metitur, & Alnos,
Et varium rudibus sylvis accommodat usum, &c.

But

But whilst we thus condemn the *Timber*, we must not omit to praise the *Mast*, which fats our *Swine* and *Deer*, and hath in some Families even supported men with bread: *Chios* indured a memorable Siege by the benefit of this *Mast*; and in some parts of *France* they now grind the *Buck* in *Mills*: It affords a sweet *Oyl*, which the poor People eat most willingly: But there is yet another benefit which this Tree presents us; that its very *leaves* (which make a natural, and most agreeable *Canopy* all the Summer) being gathered about the Fall, and somewhat before they are much *frost-bitten*, afford the best, and easiest *Mattresses* in the world to lay under our *Quilts* instead of *straw*; because, besides their tenderness and loose lying together, they continue sweet for seven or eight years long; before which time *straw* becomes *musty* and hard; they are thus used by divers persons of quality in *Dauphine*; and in *Switzerland* I have sometimes lain on them to my great refreshment; so as of this Tree it may properly be said,

The Wood's an House; the leaves a Bed.

— Sylva domus, cubilia frondet.

Juvenal.

Being pruin'd it, heals the *scar* immediately, and is not apt to put forth so soon again as other *Trees*.

The stagnant *water* in the hollow *Trees* cures the most obstinate *Tetter*, *Scabs*, and *Scurfs*, in *Man* or *Beast*, fomenting the part with it; and the *Leaves* chew'd, are wholesome for the *Gums* and *Teeth*, for which the very *Buds*, as they are in Winter hardened and dried upon the twigs, make good *Tooth-pickers*. *Swine* may be driven to *Mast* about the end of *August*.

CHAP.

C H A P. VI.

Of the *Ash*.

Ash. 1. *Fraxinus* the *Ash*, is with us reputed *Male* and *Female*, the one affecting the higher grounds: The other the plains, of a *whiter* wood, and rising many times to a prodigious stature; so as in forty years from the *Key*, an *Ash* hath been sold for thirty pounds *sterling*: And I have been credibly inform'd, that one Person hath planted so much of this one fort of *Timber* in his life time, as hath been valued worth *fifty thousand pounds* to be bought. These are pretty encouragements, for a small, and pleasant industry. That there is a *lower*, and more *knotty* fort, every *Husbandman* can distinguish.

2. The *Keys* being gathered from a young thriving tree when they begin to fall (which is about the end of *October*, and the ensuing Month) are to be laid to dry, and then sowed any time betwixt that and *Christmas*; but not altogether so deep as your former *Masts*: Thus they do in *Spain*, from whence it were good to procure some of the *keys* from their best trees: A very narrow *Seminary* will be sufficient to store a whole *Country*: They will lie a full year in the ground before they appear; therefore you must carefully *Fence* them all that time and have patience: But if you would make a considerable *Wood* of them at once, *Dig*, or *Plow* a parcel of ground, as you would prepare it for *Corn*, and with the *Corn*, especially *Oates*, (or what other *Grain* you think fittest) sow also good store of *Keys*, some *Crab-kernels*, &c. amongst them: Take off your Crop of *Corn*, or Seed in its *Season*, and the next year following, it will be cover'd with young *Ashes*, which will be fit either to *stand* (which I prefer) or be *transplanted* for divers years after; and these you will find to be far better than any you can gather out of the *Woods* (especially *Suckers*, which are worth nothing) being removed at one foot stature (the sooner the better) provided you defend them well from *Cattle*, which are exceedingly licentious after their tops: The reason of this hasty *transplanting*, is to prevent their obstinate, and deep rooting; *tantus amor terræ* — which makes them hard to be taken up when they grow older, and that being removed, they take no great hold till the second year, after which, they come away again: Yet I have planted them offive and six inches *diameter*, which have thriven as well as the smaller *wands*. You may accelerate their springing by laying the *Keys* in *Sand*, and some moist fine earth S.S.S. but lay them not too thick, or double, and in a *cover'd*, though *airie* place for a *Winter*, before you sow them; and the second year they will come away mainly; so you trim and cleanse them. Cut not his *head* at all (which being young is pithy) nor, by any means, the fibrous part of the *Roots*; only, that down-right, or *Tap-root* (which

(which gives our *Husbandmen* so much trouble in drawing) is to be totally abated: But this work ought to be in the increafe of *October*, or *November*, and not in the *Spring*. We are (as I told you) willing to spare his head rather than the side branches (which whilst young may be cut close) because being yet young, it is but of a *spongie* substance; but being once well fixed, you may cut him as close to the earth as you please; it will cause him to shoot prodigiously; so as in a few years to be fit for *Pike-shaves*; whereas if you take him *wild* out of the *Forest*, you must of necessity strike off the head, which much impairs it. Young *Ashes* are sometimes in *Winter* *frost-burnt*, black as *Coals*, and then to use the *knife* is seasonable, though they do commonly recover of themselves slowly. In *South Spain* (where as we said are the best) after the first dressing, they let them grow till they are so big, as being cleft into four parts, each part is sufficient to make a *Pike-staff*: I am told there is a *Flemish Ash* planted by the *Dutchmen* in *Lincolnshire*, which in six years grows to be worth *twenty shillings* the Tree; but I am not assur'd whether it be the *Ash* or *Abele*; either of them were, upon this account, a worthy encouragement, if at least the *latter* can be thought to bear that price, which I much question: From these low Cuttings come our *Ground-Ashes*, so much sought after for *Arbours*, *Elpaliers*, and other *Pole-works*: They will spring in abundance, and may be reduced to one for a *Standard tree*, or for *Timber*, if you design it; for thus *Hydra* like, a *Ground-cut-Ash*,

By havock, Wounds and Blows,
More lively and luxuriant grows.

Per damna, per cedes, ab ipso
Ducit opus animæque furor.

Hor.

Ash will be propagated from a *Bough* split off with some of the *old wood*, a little before the *Bud* swells, but with difficulty by *layers*. Such as they reserve for *Spears* in *Spain*, they keep shrip'd up close to the *stem*, and plant them in close order, and moister places. These they cut above the *knot* (for the least *nodosity* spoils all) in the decrease of *January*, which were of the latest for us: It is reported that the *Ash* will not only receive its own kind, but *graff*, or be *inoculated* with the *Pear* and *Apple*, but to what improvement I know not.

3. It is by no means convenient to plant *Ash* in *Flow-lands*; for the *Roots* will be obnoxious to the *Coulter*; and the *shade* of the Tree is malignant to *Corn* when the head and branches over-drip and emaciate it; but in *Hedge-rows*, and *Plumps*, they will thrive exceedingly, where they may be dispos'd at nine or ten foot distance, and sometimes nearer: But in planting of a whole *Wood* of several kinds of Trees for *Timber*, every *third* set at least, would be an *Ash*. The best *Ash* delights in the best Land (which it will soon impoverish) yet grows in any; so it be not over stiff, wet, and approaching to the *Marshy*, unless it be first well drain'd: By the Banks of sweet, and crystal *Rivers* and *Streams*, I have observ'd them to thrive infinitely. One may observe as manifest a difference in the *Timber* of *Ashes*, as of the *Oak*; much more than is

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found

found in any one kind of *Elm*, *cæteris paribus*: For so the ground-*Ash* (like the *Oak*) much excels a bough, or branch of the same bulk, for strength and toughness; and in yet farther emulation of the *Oak*, it has been known to prove as good, and lasting *Timber* for *Building*, nay, prefer'd before it, where there has been plenty of *Oak*; vast difference there is also in the strength of *Ground*, and *quarter'd Ash*: 'Tis likewise remarkable that the *Ash*, like the *Cork-tree*, grows when the *Bark* is as it were quite peel'd off, as has been observ'd in several *Forests*, where the *Deer* have bared them as far as they could climb: Some *Ash* is curiously *camleted* and vein'd, I say, so differently from other *Timber*, that our skilful *Cabinet-makers* prize it equal with *Ebony*, and give it the name of *green Ebony*, which the *Customer* pays well for; and when our *Woodmen* light upon it, they may make what money they will of it: But to bring it to that curious lustre, so as 'tis hardly to be distinguished from the most curiously diaper'd *Olive*, they *Varnish* their *Work* with the *China-varnish* (hereafter described) which infinitely excels *Linseed-oil*, that *Cardan* so commends, speaking of this *Root*. The truth is, the *Bruscum*, and *Stolunum* to be frequently found in this *Wood*, is nothing inferior to that of *Maple* (of which hereafter) being altogether as exquisitely diaper'd, and wov'd like the *Gambes* of *Achæus*; an eminent example of divers strange figures of *Fish*, *Men* and *Beasts*, Dr. *Plot* speaks of to be found in a *dining-Table* made of an old *Ash*, standing in a *Gentleman's* house some-where in *Oxford-shire*: Upon which is mention'd that of *Jacobus Gaffarelli* in his Book of *Unheard-of Curiosities*, namely, of a *Tree* found in *Holland*, which being cleft, had in the several sivers, the figures of a *Chalice*, a *Priests Albe*, his *Stole*, and several other *Pontifical Vestments*: of this sort was the *Elm* growing at *Middle-Aston* in *Oxford-shire*, a block of which wood being cleft, there came out a piece so exactly resembling a *shoulder of Veal*, that it was worthy to be reckon'd among the *Curiosities* of this nature.

4. The use of *Ash* is (next to that of the *Oak* it self) one of the most universal: It serves the *Souldier* — & *Fraxinus utilis* *hæstis*, *Ovid*, the *Carpenter*, *Wheel-wrights*, *Cart-wright*, for *Ploughs*, *Axe-trees*, *Wheelrings*, *Harrows*, *Bulls*, *Oars*, the best blocks for *Pullys*, and *Sheffs*, as *Seamen* name them; and, like the *Elm*, for the same property (of not being so apt to split and scale) excellent for *Tenons* and *Mortaises*: also for the *Cooper*, *Turner*, and *Thatcher*: Nothing like it for our *Garden Palisad-hedges*, *Hop-yards*, *Poles*, and *Spars*, *Handles*, *Stocks* for *Tools*, *Spade-trees*, &c. In sum, the *Husbandman* cannot be without the *Ash* for his *Carts*, *Ladders*, and other tackling, from the *Pike*, to the *Flow*, *Spear*, and *Bow*, for of *Ash* were they formerly made, and therefore reckon'd amongst those *woods*, which after long tension, has a natural *Spring*, and recovers its position; so as in *Peace*, and *War* it is a *Wood* in highest request: There is extract'd an *Oyl* from the *Ash*, by the *process* on other *Woods*, which is excellent to recover the *Hearing*, some drops of it being distill'd warm into the

Ears,

Ears, and for the *Caries* or rot of the *Bones*, *Tooth-ach*, pains in the *Kidneys*, and *Spleen*, the anointing therewith is most sovereign. The *Chymists* exceedingly commend the *seed* of *Ash* to be an admirable Remedy for the *Stone*. The *Manna* of *Calabria* is found to exude out of the leaves and boughs of this *Tree*, during the hot *Summer* months. Lastly, the *white*, and rotten *dottard* part composes a *ground* for our *Gallants Sweet-powder*, and the *Truncheons* make the third sort of the most durable *Coal*, and is (of all other) the sweetest of our *Forest-fueling*, and the fittest for *Ladies* Chambers, it will burn even whilst it is green, and may be reckon'd amongst the *ἀσπνα ἔλαια*. To conclude, the very dead leaves afford (like those of the *Elm*) relief to our *Cattel* in *Winter*; and there is a *dwarfe* sort in *France* (if in truth it be not, as I suspect, our *Witchen-tree*) whose *Berries* feed the poor *People*, in *scarce* years, but it bears no *Keys*, like to ours, which being *pickled* tender, afford a delicate *Salading*. But the *shade* of the *Ash* is not to be endur'd, because it produces a noxious *Insect*; and for displaying themselves so very late, and falling very early, not to be planted for *Umbrage*, or *Ornament*; especially near the *Garden*, since (besides their *predatitious Roots*) the deciduous leaves dropping with so long a *Stalk*, are drawn by clusters into the *Worm* holes, which foul the *Allies* with their falling *Keys*, and suddenly infect the ground. Note, that the *season* for *selling* of this *Tree* must be when the *Sap* is fully at rest; for if you cut it down too early, or over late in the year, it will be so obnoxious to the *Worm*, as greatly to prejudice the *timber*; therefore to be sure, *sell* not till the three *Mid-winter* Months, beginning about *November*: But in *Lopping* of *Pollards* (as of *soft Woods*) Mr. *Cook* advises it should be towards the *Spring*, and that you do not suffer the *Lops* to grow too great: Also, that so soon as a *Pollard* comes to be considerably *hollow* at the *head*, you suddenly cut it down, the *body* decaying more than the *head* is worth: the same he pronounces of taller *Ashes*, and where the *Wood-peckers* make holes (who constantly indicate their being faulty) to fell it in the *Winter*: I am astonish'd at the universal Confidence of all our *Botanists*, that a *Serpent* will rather creep into the *Fire*, than over a twig of *Ash*; this is an old *Imposition* of *Pliny*, who either took it up upon trust, or we mistake the *Tree*.

C H A P. VII.

Of the Chesnut.

Chesnuts. 1. **T**HE next is the *Chesnut*, [*Castanea*] of which *Pliny* reckons many kinds, especially about *Tarentum* and *Naples*; but we commend those of *Portugal* or *Bayone*, choosing the largest brown and most ponderous for fruit, such as *Pliny* calls *Coltiwe*, but the lesser ones to raise for *Timber*. They are produc'd best by sowing; previous to which, let the *Nuts* be first spread to sweat, then cover them in sand; a Month being past, plunge them in *Water*, reject the *swimmers*; being dry'd, for thirty days more, sand them again, and to the water-ordeal as before. Being thus treated till the beginning of *Spring*, or in *November*, let them as you would do *Beans*; and as some practise it, drench'd for a *Night* or more, in new *Milk*: They should be put into the holes with the poynt upmost, as you plant *Tulips*; *Pliny* will tell you they come not up, unless four, or five be pil'd together in a hole; but that is false, if they be good, as you may presume all those to be which pass this examination; nor will any of them fail: But being come up they thrive best unremoved, making a great stand for at least two years, upon every transplanting; yet if needs you must alter their station, let it be done about *November*, and that into a light friable ground, or moist *Gravel*, however they will grow even in *Clay*, *Sand*, and all mixed Soils, upon exposed, and bleak places, and the pendent declivities of *Hills* to the North, in dry airy places, and sometimes near *Marshes* and *Waters*; but they affect no other compost, save what their own leaves afford them, and are more patient of cold than heat: As for their sowing in the *Nursery*, treat them as you are taught in the *Wall-Nut*.

2. If you desire to set them in *Winter*, or *Autumn*, I counsel you to inter them within their *Husks*, which being every way arm'd, are a good protection against the *Mouse*, and a providential integument. *Pliny* l. 15. c. 23. from this natural Guard, concludes them to be excellent food, and doubtless *Cesar* thought so, when he transported them from *Sardinia* first into *Italy*, whence they were propagated into *France*, and thence among us; another encouragement to make such Experiments out of foreign Countries. Some sow them confusedly in the *Furrow* like the *Acorn*, and govern them as the *Oak*; but then would the ground be broken up 'twixt *November* and *February*; and when they spring, be cleaned at two foot asunder, after two years growth: Likewise may Copies of *Chesnuts* be wonderfully increased, and thickened, by laying the tender and young branches; but such as spring from the *Nuts* and *Marrons*, are best of all, and will thrive exceedingly; if (being let stand without removing) the ground be stirr'd, and loosened about their Roots, for two or three of the first years, and the

the superfluous wood prun'd away; and indeed for good Trees, they should be shrip'd up after the first years removal; they also shoot into gallant *Poles* from a felled *Stem*: Thus will you have a *Copse* ready for a felling, within eight years, which (besides many other uses) will yield you incomparable *Poles* for any work of the *Garden*, *Vineyard*, or *Hopyard*, till the next cutting: And if the Tree like the ground, will in ten, or twelve years grow to a kind of *Timber*, and bear plentiful fruit.

3. I have seen many *Chesnut-trees* transplanted as big as my arm, their heads cut off at five and six foot height; but they came on at leisure: In such Plantations, and all others for *Avenues*, you may set them from thirty, to ten foot distance, though they will grow much nearer, and shoot into *Poles*, if (being tender) you cultivate them like the *Ash*, the nature of whose shade it resembles, since nothing affects much to grow under it: Some *Husbands* tell me, that the young *Chesnut-trees* should not be pruned or touch'd with any knife or edge-tool, for the first three or four years, but rather crop'd or broken off, which I leave to farther Experience.

4. The *Chesnut* being grafted in the *Walnut*, *Oak*, or *Beech* (I have been told) will come exceeding fair, and produce incomparable Fruit; for the *Walnut*, and *Chesnut* in each other, it is probable; but I have not as yet made a full attempt; they also speak of inoculating *Cherries* in the *Chesnut*-stock for a later fruit. In the mean time, I with we did more universally propagate the *Horse-Chesnut*, which being easily increas'd from layers, grows into a goodly *Standard*, and bears a most glorious flower, even in our cold Country: This Tree is now all the mode for the *Avenues* to their Country Palaces in *France*, as appears by the late *Superintendents* Plantation at *Vaux*. It was first brought from *Constantinople* to *Vienna*, thence into *Italy*, and so *France*; but to us from the *Lowant* more immediately, and flourishes so well, and grows so goodly a Tree in competent time, that by this alone, we might have ample encouragement to Denizen other Strangers amongst us.

5. The *Chesnut* is (next the *Oak*) one of the most sought after by the *Carpenter* and *Joyner*: It hath formerly built a good part of our ancient Houses in the *City of London*, as does yet appear. I had once a very large *Barn* near the *City*, fram'd intirely of this *Timber*: And certainly they grew not far off; probably in some Woods near the *Town*: For in that description of *London* written by *Fitz-Stephens*, in the Reign of *Hen. 2.* he speaks of a very noble, and large Forest which grew on the *Boreal* part of it: *Proxime* (says he) *pates foresta ingens, saltus nemorosi ferarum, latebra cervorum, damarum, aprorum, & taurorum Sylvestrinum, &c.* A very goodly thing it seems, and as well stor'd with all sorts of good *Timber*, as with *Venison* and all kind of *Chase*. The *Chesnut* affords the best *Stakes*, and *Poles* for *Palisades*, *Pedaments* for *Vine-props*, and *Hops*, as I said before: Also for *Mill-timber* and *Water-works*, or when it may lie buried; but if water touch

touch the *Roots* of the growing Trees, it spoils both *Fruit* and *Timber*: 'Tis likewise observed, that this *Tree* is so prevalent against *cold*, that where they stand, they defend other Plantations from the injuries of the severest frosts: I am sure being planted in *Hedge-rows*, & circa *agrorum itinera*, or for *Avenues* to our *Country-houses*, they are a magnificent, and royal Ornament. This *Timber* also does well for *Columns*, *Tables*, *Chests*, *Chairs*, *Stools*, *Bedsteads*; for *Tubs*, and *Wine-Cask*, which it preserves with the least tincture of the *wood* of any whatsoever: If the *Timber* be dip'd in *scalding Oyl*, and well *Pitch'd*, it becomes extremely durable; but otherwise I cannot celebrate the *Tree* for its sincerity, it being found that (contrary to the *Oak*) it will make a fair shew outwardly, when 'tis all decay'd, and rotten within; but this is in some sort recompenc'd, if it be true, that the *Beams* made of *Chestnut-tree* have this property, that being somewhat brittle, they give warning, and premonish the danger by a certain crackling which it makes: Formerly they made *Consultatory Staves* of this *Tree*; and the *Variegated Rods* which *Jacob* peel'd to lay in the *Troughs*, and impress a fancy in his *Father-in-law's* conceiving *Emes*, were of this material. The *Coals* are excellent for the *Smith*, being soon kindled, and as soon extinguish'd; but the *Asbes* of *Chestnut-wood* are not convenient for to make a *Lee* with, because it is observ'd to stain the *Linnen*. As for the *Fruit*, 'tis better to beat it down from the *Tree*, some little time before they fall off themselves; thus, they will the better keep, or else you must smoke-dry them. But we give that fruit to our *Swine* in *England*, which is amongst the delicacies of *Princes* in other Countries; and being of the larger *Nut*, is a lusty, and masculine food for *Rusticks* at all times; and of better nourishment for *Husbandmen* than *Cole*, and *rusty Bacon*; yea, or *Beans* to boot, instead of which, they boyl them in *Italy* with their *Bacon*; and in *Virgil's* time, they ate them with *Milk* and *Cheese*. The best *Tables* in *France* and *Italy* make them a *Service*, eating them with *Salt*, in *Wine*, or juice of *Lemon* and *Sugar*; being first roasted in *Embers* on the *Chaplet*; and doubtless we might propagate their use, amongst our common people (as of old the *Βαλανοφάγοι*) being a food so cheap, and so lasting. In *Italy* they also boyl them in *Wine*, and then smoke them a little, these they call *Anseri* or *Geese*, I know not why: Those of *Piemont* add *Fennel*, *Cinamon* and *Nutmeg* to their *Wine*, but first they peepe them. Others macerate them in *Rose-water*. The *Bread* of this flower is exceeding nutritive; 'tis a robust food, and makes *Women* well complexion'd, as I have read in a good Author: They also make *Fritters* of *Chestnut-flower*, which they wet with *Rosewater*, and sprinkle with grated *Parmegiano*, and so fry them in fresh *Butter*, a delicate: How we here use them in stew'd-meats, and *Beatille-Pyer*, our *French-Cooks* teach us; and this is in truth the very best use of their *Fruit*, and very commendable; for it is found that the eating of them raw, or in *Bread* (as they do much about *Limosin*) is apt to swell the belly, though without any other inconvenience that I can learn, and yet

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some condemn them as dangerous for such as are subject to the *Gravel* in the *Kidnies*. The best way to preserve them, is to keep them in Earthen vessels in a cold place; some lay them in a *Smoke-loft*, others, in dry *Barly-straw*, others, in *Sand*, &c. The leaves of the *Chestnut-tree* make very wholesome *Mattraffes* to lye on, and they are good *Littier* for *Cattel*: But those *leasse beds*, for the crackling noise they make when one turns upon them, the *French* call *Lits de Parlement*: Lastly, the flower of *Chestnut*, made into an *Electuary* with *Honey*, is an approved *Remedy* against spitting blood, and the *Cough*; and a decoction of the *Rind* of the *Tree*, tinctures hair of a golden Colour, esteem'd a beauty in some countries.

CHAP. VIII.

Of the Walnut.

1. *Uglani, quasi Jovis glani*, the *Wall*-or *Welch-nut* (though *Walnut*, no where growing of it self, some say, in *Europe*) is of several sorts; the *soft-shell*, and the *hard*, the *whiter*, and the *black*-*er grain*: This *black* bears the worst *Nut*, but the *Timber* much to be preferred, and we might propagate more of them if we were careful to procure them out of *Virginia*, where they abound and bear a squarer *Nut*, of all other the most beautiful, and best worth planting; Indeed, had we store of these, we should soon despise the rest; yet those of *Grenoble* come in the next place, and are much priz'd by our *Cabinet-makers*: In all events, be sure to plant from young and thriving Trees, bearing full and plump *Kernels*. It is said that the *Walnut* kernel wrap'd in its own leaf, being carefully taken out of its shell, brings a *Nut* without shell, but this is a trifle; the best way to elevate them is, to set them as you do the *Chestnut*, being planted of the *Nut*, or set at the distance you would have him stand; for which they may be prepared by beating them off the *Tree* (as was prescribed of the *Chestnut*) some dayes before they quit the Branches of themselves, and kept in their husks, or without them, till *Spring*, or by bedding them (being dry) in *sand*, or good *Earth*, till *March* or earlier, from the time they fell, or were beaten off the *Tree*: Or if before, they be set with husk and all upon them; for the extreme bitterness thereof is most extirpal, and deadly to *Worms*; or it were good to strew some *Furze* (broken or chop'd small) under the ground amongst them, to preserve them from *Mice* and *Rats*, when their shells begin to wax tender; especially if, as some, you supple them a little in warm *Cow-milk*; but being treated as before, you will find them already sprouted, and have need only to be planted where they are to abide; because (as we said long since) they are most impatient

impatient of *transplanting* : But if there be an absolute necessity of *removing*, let your Tree never be above four years old, and then by no means touch the *head* with your *Knife*, nor cut away so much as the very *Tap-root*, being so old, if you can well dispose of it, since being of a pithy, and hollow substance, the least diminution, or bruise, will greatly endanger the killing : But see here what we have said of the *Chestnut* ; I have been told, that the very *Tops*, and palish *Buds* of this Tree, when it first sprouts, though as late as *April*, will take hold of the ground, and grow to an incredible improvement ; but first they steep them in *Milk* and *Saffron* ; but this attempt did not succeed with us, yet it will be propagated by a *Branch* slipp'd off with some of the *old wood*, and set in *February* : An industrious, and very experienc'd *Husbandman* told me, that if they be *transplanted* as big as ones *Middle*, it may be done safer than when younger ; I do only report it : What they hint of putting a *Tile-sward* under the *Nuts* when first set, to divaricate and spread the *Roots* (which are otherwise apt to penetrate very deep) I like well enough ; 'tis certain they will receive their own *Cyons* being *Grafted*, and that it does improve their *Fruit* : The best compost is the strewing of *Ashes* at the foot of the Trees, the *Salt* whereof being washed into the Earth, is the best dressing, whilst the juice of the fallen *leaves*, though it kill the *Worm*, is noxious to the *Root*. This Tree does not refuse to thrive even among others, and in great *Woods*, provided you strip up the collateral arms.

2. The *Walnut* delights in a dry, sound, and rich land ; especially if it incline to a feeding *Chalk*, or *Marle* ; and where it may be protected from the cold (though it affect cold rather than extreme heat) : as in great Pits, Vallies and Highway sides ; also in Stony-grounds, if *loamy*, and on Hills, especially *Chalkie* : likewise in *Cornfields* : Thus *Burgundy* abounds with them, where they stand in the midst of goodly *Wheat-lands*, at sixty, and an hundred foot distance ; and it is so far from hurting the *crop*, that they look on them as a great Preserver, by keeping the grounds warm ; nor do the roots hinder the *Plow*. When ever they fell a Tree (which is only the old, and decayed) they always plant a young one near him ; and in several places 'twixt *Hanau*, and *Frankfort* in *Germany*, no young *Farmer* whatsoever is permitted to *Marry* a *Wife*, till he bring proof that he hath planted, and is a Father of such a stated number of *Walnut-trees*, as the Law is inviolably observed to this day, for the extraordinary benefit which this Tree affords the *Inhabitants* : And in truth, were this Timber in greater plenty amongst us, we should have far better *Ustensils* of all sorts for our Houses, as *Chairs*, *Stools*, *Bedsteads*, *Tables*, *Wainscot*, *Cabinets*, &c. instead of the more vulgar *Beech*, subject to the *worm*, weak, and unsightly ; but which to counterfeit, and deceive the unwary, they wash over with a decoction made of the *Green husks* of *Walnuts*, &c. I say, had we store of this material, especially of the *Virginian*, we should find an incredible improvement.

provement in the more stable Furniture of our Houses ; as in the first frugal, and better days of *Rome*, when

Tables made here at home, those times behold,
Of our own Wood, for that same purpose fell'd,
Old Walnut blown down, when the Wind set East.
Juv. l. 4. Sat. 11.

See R. Stappleton.

illa domi natae, nostraque ex arboribus mensas
Tempora cedebant : hoc lignum stabat in usus,
Anno jam si forte nocem decesserat Eurus.

for if it had been cut in that season, it would not have prov'd so sound, as we shew in our Chapter of *Felling*. It is certain, that the *Menſe nucinae*, were once in price even before the *Citrim*, as *Sirabo* notes ; and nothing can be more beautiful, than some *Planks*, and Works which I have beheld of it, especially that which comes from *Grenoble*, of all other the most beautiful and esteem'd.

3. They render most graceful *Avenues* to our Country dwellings, and do excellently near *Hedge-rows* ; but had need be planted at forty, or fifty foot interval, for they affect to spread both their *Roots* and *Branches*. The *Bergstrass* (which extends from *Heidelberg* to *Darmstadt*) is all planted with *Walnuts* ; for so by another antient Law, the *Bordurers* were obliged to nurse-up, and take care of them ; and that chiefly, for their ornament and shade ; so as a man may ride for many miles about that Countrey, under a continued *Arbour*, or *Close-walk* ; the *Traveller* both refresh'd with the *Fruit*, and the *shade*, which some have *caustically* defin'd for its ill effects on the *head*, for which the *Fruit* is a *specificke* and a notable *signature* ; although I deny not, but the scent of the fallen leaves, when they begin to be damp'd with lying, may emit somewhat a heady steam, which to some has prov'd noxious ; but not whilst they were fresh, and lively upon the Trees. How would such publick *Plantations* improve the Glory, and Wealth of a Nation ! but where shall we find the *Spirits* among our Countrymen ? Yes, I will adventure to instance in those *Plantations* of Sir *Richard Stidolph*, upon the Downs near *Lether-head* in *Surry* ; Sir *Robert Clayton* at *Morden* near *Godstone* (once belonging to Sir *John Evelyn*) and so about *Cassanlon*, where many thousands of these Trees do celebrate the industry of the Owners, and will certainly reward it with infinite improvement, as I am assur'd they do in part already, and that very considerably ; besides the Ornament which they afford to those pleasant *trac'ts*, for some *Miles* in circumference. I remember *Monsieur Sorbriere*, in a *Sceptical* discourse to *Monsieur de Martel*, speaking of the readiness of the People in *Holland* to furnish, and maintain whatsoever may conduce to the publick Ornament, as well as convenience ; tells us, that their *Plantations* of these and the like Trees, even in their very *Roads*, and common *Highways*, are better preserv'd, and entertain'd (as I my self have likewise been often an eye-witness) than those about the Houses, and Gardens of pleasure belonging to the Nobles and Gentry of most other Countreies : And in effect it is a most ravishing object, to behold their amenities in this particular : With us says he (speaking of *France*) they make a jest at such political Ordinances, by ruining these publick and useful Ornaments, if haply some more prudent *Magistrate*, do at any time introduce them.

them. Thus in the Reign of Henry the fourth, during the *Superintendency* of Monsieur de Sully, there was a resolution of adorning all the *High-ways* of France with *Elms*, &c. but the rude, and mischievous *Paysans*, did so hack, steal, and destroy what they had begun, that they were forced to desist from the thorough prosecution of the design; so as there is nothing more expos'd, wild, and less pleasant than the Common *Roads* of France for want of *shade*, and the decent *limits* which these sweet, and divertissant *Plantations* would have afforded; not to omit that *Political* use, as my Lord Bacon hints it, where he speaks of the *Statues*, and *Monuments* of brave men, and such as had well deserv'd of the *Publick*, erected by the *Romans* even in their *High-ways*, since doubtless, such noble, and agreeable objects, would exceedingly divert, entertain, and take off the *Minds*, and *Discourses* of *Melancholy* people, and pensive *Travellers*, who having nothing but the dull, and enclosed Ways to cast their eyes on, are but ill *Conversation* to themselves, and others, and in stead of Celebrating, Censure their Superiours. It is by a curious *Person*, and industrious *Friend* of mine, observ'd, that the *Sap* of this Tree rises, and descends with the *Suns* diurnal course (which it visibly slackens in the *Nights*) and more plentifully at the *Root* on the *South-side*, though those on the *North* were larger, and less distant from the Body of the Tree; and not only diffill'd from the ends, which were next the *Stem*, but from those which were cut off and separated, which was never observed to happen in the *Birch*, or other *Sap-yielding* Trees.

4. What universal use the *French* make of the *Timber* of this *sole* Tree, for domestic affairs, may be seen in every Room both of Poor and Rich: It is of singular account with the *Joyner*, for the best grain'd, and colour'd *Wainscot*; with the *Gunsmith* for *Stocks*, for *Coach-wheels* excellent, and the Bodies of *Coaches*, (they make *hoops*, and *Bows* with it in *New-England*, for want of *Tew*;) the *Drum-maker* uses it for *Rimbs*, the *Cabinet-maker* for *Inlayings*, especially the firm, and close *Timber* about the *Roots*, which is admirable for *stick'd* and *chamblotted* works, some wood especially, as that which we have from *Bologne* and *New-England*, very black of Colour, and so admirably streaked, as to represent natural *flowers*, *Landships*, and other Fancies: To render this the better colour'd, *Joyners* put the boards into an *Oven* after the *batch* is forth, or lay them in a warm *Stable*, and when they work it, polish it over with its own *Oyl* very hot, which makes it look black and sleek, and the older it is, the more esteemable; but then it should not be put in work till thoroughly seasoned, because it will shrink beyond expectation. It is only not good to confide in it much for *beams*, or *Joynts*, because of its brittleness, of which yet, it has been observed to give timely notice, by the crackling before it breaks. Besides the uses of the *Wood*, the *fruit* with *husk* and all when tender and very young, is for *preserves*, for *food*, and *Oyl*, of extraordinary use with the *Painter*, in *whites*, and other delicate *Colours*, also for *Gold-size*, and *Vernish*; and with this

this they polish *Walking-staves*, and other works which are wrought in with burning: For *Food* they Fry with it in some places, and use it to burn in *Lamps*; the younger *Timber* is held to make the better colour'd work (and so the *Oak*;) but the older more firm and close, is finer *Chamblotted* for Ornaments; and the very *husks* and *leaves* being macerated in warm Water, and that *Liquor* poured on the *Carpet* of *Walks*, and *Bowling-greens*, does infallibly kill the *Worms*, without endangering the grass; not to mention the *Dye* which is made of this *Lixivie*, to Colour *Wooll*, *Woods*, and *Hair*, as of old they us'd it. The water of the *Husks* is sovereign against all pestilential infections, and that of the *leaves* to *mundifie*, and heal inveterate *Ulcers*. That which is produc'd of the *thick-shell*, becomes best *Timber*, that of the *thinner* better *Fruit*. *Columella* has sundry excellent Rules how to ascertain, and accelerate the growth of this Tree, and to improve its qualities; and I am assur'd, that having been Grafted on the *Ash* (though others say no *Infection* improves it) they thrive exceedingly, become handsome Trees, and what is most estimable, bears its *fruit* within four years, all which I recommend to the farther Industrious. The green *husk* dry'd, or the first peeping red *Buds* and *leaves* reduc'd to powder, serves in stead of *Pepper*, to condite meats and sauces. 'Tis better to cudgel off the *Fruit*, when dropping ripe, than to gather it by hand; and that the *husk* may open, lay them by in a dry room, sometimes turning them with a broom, but without washing, for fear of mouldiness. In Italy they arm the tops of long Poles with nails and Iron for the purpose, and believe the beating improves the Tree: Those *Nuts* which come not easily out of their *husks*, should be laid to mellow in heaps, and the rest expos'd in the *Sun*, till the *shells* dry, else they will be apt to perish the *Kernel*: Some again preserve them in their own *leaves*, or in a Chest made of *Walnut-tree* wood; others in *Sand*, especially, if you will preserve them for a *Seminary*: do this in *October*, and keep them a little moist, that they may *spear*, to be set early in *February*: Thus after two years they may be remov'd at a yard asunder, cutting the *tap-root*, and *side branches*, but sparing its head; and being two yards high, *bud*, or remove them immediately. Old *Nuts* are not wholesome till macerated in warm, and almost boiling water; but if you lay them in a *Leaden* pot, and bury them in the Earth, so as no *Vermine* can attack them, they will keep marvellously plump the whole year about, and may easily be blanched: In Spain they use to strew the gratings of old, and hard *Nuts* (first peel'd) into their *Tarts* and other Meats. For the *Oyl*, one *Bushel* of *Nuts* will yield fifteen pounds of peel'd and clear *Kernels*, and that half as much *Oyl*, which the sooner 'tis drawn, is the more in quantity, though the dryer the *Nut*, the better in quality; the *Lees*, or *Mare* of the *Pressing*, is excellent to fatten *Hogs* with. After the *Nuts* are beaten down, the *leaves* would be sweep'd into heaps, and carried away, because their extreme Bitterness impairs the ground, and as I am assur'd, prejudices the Trees: The Green *husks* boyled, make a good Colour to dye a

dark Yellow, without any mixture; and the distillation of its leaves with Hony and Urine, makes Hair spring on bald-heads: Besides its use in the Famous *Salernitan Antidote*; if the Kernel a little masticated, be applied to the biting of a suspected Mad-dog, and when it has lain three hours, be cast to *Poultrey*, they will dye if they eat of it. In *Italy*, when a Country-man finds any pain in his Side, he drinks a Pint of the fresh Oyl of this Nut, and finds immediate ease: The Juice of the outward rind of the Nut, makes an excellent gargle for a Sore-Throat: The Kernel being rub'd upon any crack or chink of a Leaking or crasy Vessel, stops it better than either Clay, Pitch, or Wax: In *France* they eat them blanch'd and fresh, with Wine and Salt, having first cut them out of the shells before they are hardned, with a short broad Brass-knife, because Iron rusts, and these they call *Cernois*, from their manner of scooping them out.

CHAP. IX.

Of the Mulberry.

Mulberry. 1. **M**orus, the *Mulberry*: It may possibly be wonder'd by some, why we should insert this Tree amongst our Forest Inhabitants; but we shall soon reconcile our industrious Planter, when he comes to understand the incomparable benefit of it, and that for its Timber, durableness, and use for the Joyner and Carpenter, and to make Hoops, Bows, Wheels, and even Ribs for small Vessels in stead of Oak, &c. though the Fruit and the leaves had not the due value with us, which they deservedly enjoy in other places of the World.

2. But it is not here I would recommend our ordinary black fruit bearers, though that be likewise worth the propagation; but that kind which is call'd the *White Mulberry* (which I have had sent me out of *Languedoc*) one of them of a broad leaf, found there and in *Provence*, whose Seeds being procured from *Paris*, where they have it from *Avignon*, should be thus treated in the Seminary.

3. In Countries where they cultivate them for the Silk-worm, and other uses, they sow the perfectly mature berries of a Tree, whose Leaves have not been gather'd; these they shake down upon an old Sheet, spread under the Tree, to protect them from Gravel and Ordure, which will hinder you from discerning the Seed: If they be not ripe, lay them to mature upon Shelves, but by no means till they corrupt; to prevent which, turn them daily; then put them in a fine Sieve, and plunging it in Water, bruise them with your hand; do this in several Waters, then change them in other clear Water, and the Seed will sink to the bottom, whilst the pulp swims,

swims, and must be taken off carefully: This done, lay them to dry in the Sun upon a linnen Cloth, for which, one hour is sufficient, then Fan and sift it from the husks, and reserve it till the season. This is the process of curious persons, but the sowing of ripe *Mulberries* themselves is altogether as good, and from the excrement of Hogs, and even Dogs (that will frequently eat them) they will rise abundantly: Note, that in sowing the Berry 'tis good to squash, and bruise them with fine sifted Mould, and if it berich, and of the old bed, so much the better: They would be interr'd, well moistned and cover'd with straw, and than rarely water'd till they peep; Or you may squeeze the ripe Berries in Ropes of Hair or Bast, and bury them as is prescrib'd for Hips and Hams; the Earth in which you sow them, should be fine Mould, and as rich as for Melons, rais'd a little higher than the Area, as they make the Beds for ordinary Pot-herbs, to keep them loose and warm, and in such beds you may sow Seeds as you do Purslane, mingled with some fine Earth, and thinly cover'd, and then for a fortnight, strew'd over with straw, to protect them both from sudden heat, and from birds: The Season is April or May, though some forbear even till July and August, and in the second quarter of the Moon, the Weather calm and serene. At the beginning, keep them moderately fresh (not over wet) and clean weeded, secured from the rigor of Frosts; the second year of their growth about the beginning of October, or early Spring, draw them gently out, prune the Roots, and dipping them a little in Pond-water, transplant them in a warm place or Nursery; 'tis best ranging them in Drills, two foot large, and one in depth, each drill three foot distance, and each Plant two. And if thus the new Earth be somewhat lower than the Surface of the rest, 'twill the better receive the Rain: Being Planted, cut them all within three Inches of the ground. Water them not in Winter, but in extrem necessity, and when the weather is warm, and then do it in the Morning. In this cold Season you shall do well to cover the ground with the Leaves of Trees, Straw, or short Littier, to keep them warm; and every year you shall give them three Dressings, or half dressings; viz. in April, June, and August; this, for the first year, still after Rain: The second Spring after Transplanting, purge them of all superfluous shoots and Scions, reserving only the most towards for the future Stem; this to be done yearly, as long as they continue in the Nursery; and if of the principal Stem so left, the frost mortifie any part, cut it off, and continue this government till they are near six foot high, after which suffer them to spread into heads by discreetly pruning, and fashioning them: But if you plant where Cattel may endanger them, the stem had need be taller, for they are extremely liquorish of the leaves.

4. When now they are about five years growth, you may transplant them without cutting the Root (provided you irradiate them with care) only trimming the head a little; the Season is from September to November in the New Moon, and if the holes or pits you set them in were dug, and prepar'd some months before, it would

would much secure their taking; some cast *horns, bones, shells*, &c. into them the better to loosen the earth about them, which should be rich, and well refresh'd all *Summer*. A light, and dry *Mould*, is best, well expos'd to the *Sun* and *Air*, which above all things this *Tree* affects, and hates *watery* low grounds: In sum, they thrive best where *Vines* prosper most, whose society they exceedingly cherish; nor do they less delight to be amongst *Corn*, no way prejudicing it with its shade. The *Distance* of these *Standards* would be twenty, or twenty four foot every way, if you would design *Walks* or *Groves* of them; if the *Environs* of *Fields*, *Banks* of *Rivers*, *High-ways*, &c. twelve, or fourteen foot may suffice, but the farther distant, the better.

5. Another Expedient to increase *Mulberries* is, by *Layers* from the *Suckers* at the foot, this done in *Spring*, leaving not above two *Buds* out of the Earth, which you must diligently *water*, and the second year they will be rooted: They will also take by passing any branch or Arm slit, and kept a little open with a *wedge*, or stone, through a basket of *Earth*, which is a very sure way: Nay, the very *Cuttings* will strike in *Spring*, but let them be from *Shoots* of two years growth, with some of the old Wood, though of seven or eight years; these set in *Rills* like *Vines*, having two or three *Buds* at the top, will root infallibly, especially if you twist the old Wood a little, or at least *hack* it, though some slit the *foot*, inserting a *stone*, or grain of an *Oate*, to fuddle and entertain the *Plant* with moisture.

6. They may also be propagated by *Grafting* them on the *black Mulberry* in *Spring*, or *inoculated* in *July*, taking the *cyons* from some old tree, that has broad, even, and round leaves, which causes it to produce very ample, and tender leaves, of great emolument to the *Silk-master*.

7. Some experienced *Husbandmen* advise to poll our *Mulberries* every three, or four years, as we do our *Willows*: others not till 8 years: both erroneously. The best way is yearly to *prune* them of their dry, and superfluous branches, and to form their *heads* round and natural. The first year of *removal* where they are to abide, cut off all the *shoots* to five, or six of the most promising: the next year leave not above three of these, which dispose in *triangle* as near as may be, and then disturb them no more, unless it be to *purge* them (as we taught) of dead *Scare-wood*, and extravagant parts, which may impeach the rest; and if afterward any *prun'd* branch shoot above three or four *Cyons*, reduce them to that number. One of the best ways of *Pruning* is, what they practise in *Sicily* and *Provence*, to make the head *hollow* and like a *bell*, by cleansing them of their inmost branches; and this may be done, either before they bud, *viz.* in the *New Moon* of *March*, or when they are full of *leaves* in *June* or *July*, if the season prove any thing fresh. Here I must not omit what I read of the *Chinese* culture, and which they now also imitate in *Virginia*, where they have found a way to raise these *Plants* of the *Seeds*, which they *mow* and cut like a *crop* of *Grass*, which sprout, and bear leaves again in a few months: They likewise (in *Virginia*) have planted them in *Hedges*, as near together

together as we do *Goose-berries* and *Currants*, for their more convenient *Clipping*, which they pretend to do with *scissers*.

8. The *Mulberry* is much improv'd by stirring the *Mould* at root, and *Letation*.

9. We have already mentioned some of the *Uses* of this excellent *tree*, especially of the *white*, so called because the *fruit* is of a *paler* colour, which is also of a more *luscious* taste, and less than the *black*; The *rind* likewise is *whiter*, and the *leaves* of a *mealy* clear *green* colour, and far tenderer, and sooner produc'd by at least a fortnight, which is a marvellous advantage to the newly disclos'd *Silk-worm*; Also they arrive sooner to their maturity, and the food produces a finer *web*. Nor is this *tree* less beautiful to the eye than the fairest *Elm*, very proper for *Walks* and *Avenues*: The *timber* (amongst other properties) will last in the *water* as well as the most solid *Oak*, and the *bark* makes good, and tough *Bast-ropes*. It suffers no kind of *Vermin* to breed on it, whether standing or fell'd, nor dares any *Caterpillar* attack it save the *Silk-worm* only. The *Loppings* are excellent *fuel*: But that for which this *tree* is in greatest, and most worthy esteem, is for the *Leaves*, which (besides the *Silk-worm*) nourishes *Cows*, *Sheep*, and other *cattels*; especially young *Porkers*, being boil'd with a little *bran*: and the *fruit* excellent to feed *Poultry*. In sum, what ever eats of them, will with difficulty be reduc'd to endure any thing else, as long as they can come by them; to say nothing of their other sovereign qualities, as *relaxing* of the *belly* being eaten in the morning, and curing *Inflammations* and *Ulcers* of the *mouth* and *throat*, mix'd with *Mel Rosarum*, in which *Receipt* they do best, being taken before they are over-ripe.

10. To proceed with the *Leaf* (for which they are chiefly cherish'd) the benefit of it is so great, that they are frequently *let* to *farm* for vast sums; so as some one *sole tree* has yielded the *proprietor* a rent of twenty *Shillings per Annum*, for the *Leaves* only; and six or seven pounds of *Silk*, worth as many pounds *Sterling*, in five or six weeks, to those who keep the *worms*. We know that till after *Italy* had made *Silk* above a thousand years, (and where the *Tree* it self was not a stranger, none of the *Antients* writing any thing concerning it) they receiv'd it not in *France*; it being hardly yet an *hundred*, since they betook themselves to this *manufacture* in *Provence*, *Languedoc*, *Dauphine*, *Lionnois*, &c. and not in *Tonrain*, and *Orleans* till *Hen. the Fourth's* time; but it is incredible what a *Revenue* it amounts to in that *Kingdom*. About the same time, or a little after, it was that *King James* did with extraordinary care recommend it to this *Nation*, by a *Book of Directions*, *Acts of Council*, and all other Princely assistance. But this did not take, no more than that of *Hen. the Fourth's* Proposal about the *Environs* of *Paris*, who filled the *High-ways*, *Parks* and *Gardens* of *France* with the trees, beginning in his own *Gardens* for encouragement: Yet, I say, this would not be brought into example, till this present great *Monarch*, by the indefatigable diligence of *Monsieur Colbert* (*Superintendent of His Majesties manufactures*) who

who has so successfully reviv'd it, that 'tis prodigious to consider what an happy progress they have made in it; to our shame be it spoken, who have no other discouragements from any insuperable difficulty whatever, but our *sloth*, and want of *industry*; since where ever these *trees* will grow and prosper, the *silk-worms* will do so also; and they were alike averſe, and from the very same suggestions, where now that *manuſacture* flourishes in our *neighbour* Countries. It is demonstrable, that *Mulberries* in four, or five years may be made to spread all over this *Land*; and when the indigent, and young *dughters* in proud Families are as willing to gain three or four Shillings a day for gathering *Silk*, and buying themselves in this sweet, and easie *employment*, as some do to get *four pence* a day for hard work at *Hemp*, *Flax*, and *Wool*; the reputation of *Mulberries* would spread in *England* and other Plantations. I might say something like this of *Saffron*, which we yet too much neglect the *culture* of; but, which for all this, I do not despair of seeing reſtaur'd, when that good *Genius* returns. In order to this hopeful *Prognostick* we will add a few *Directions* about the gathering of their *Leaves*, to render this *chapter* one of the most accomplish'd, for certainly one of the most *accomplish'd* and agreeable *works* in the world.

11. The *Leaves* of the *Mulberry* should be collected from *trees* of seven or eight years old; if of such as are very *young*, it impairs their growth, neither are they so healthful for the *worms*, making them *hydropical* and apt to burst: As do also the *Leaves* of such *trees* as be planted in a too *waterish* or over-rich *soil*, or where no *sun* comes, and all sick, and *yellow* leaves are hurtful. It is better to *clip*, and let the *leaves* fall upon a subtended *sheet* or *blanket*, than to gather them by hand; and to *gather* them, than to *strip* them, which marring, and gauls the *branches*, and bruises the *leaves* that should hardly be touched. Some there are who lop off the *boughs*, and make it their *pruning*, and it is a tolerable way, so it be discreetly done in the over-thick parts of the *tree*; but these *leaves* gather'd from a separated branch will die, and wither much sooner than those which are taken from the *tree* immediately, unless you set the *stem* in water. *Leaves* gathered from boughs cut off, will shrink in three hours; whereas those you take from the living *tree*, will last as many days; and being thus a while kept, are better than over-fresh ones. It is a *Rule*, never to gather in a rainy season, nor cut any *branch* whilst the *wet* is upon it; and therefore against such suspected times, you are to provide before hand, and to reserve them in some *fresh*, but *dry* place: the same *caution* you must observe for the *dew*, though it do not rain, for *wet* food kills the *worms*. But if this cannot be altogether prevented, put the *leaves* between a pair of *sheets* well dried by the *fire*, and shake them up and down till the moisture be drunk up in the *linen*, and then spreading them to the air a little, on another dry cloth, you may feed with them boldly. The top-leaves and oldest, would be gathered last of all, as being most proper to repast the *worms* with towards their last change. The *gatherer* must be neat, and have his hands

hands clean, and his *breath* sweet, and not poison'd with *Onions*, or *Tobacco*, and be careful not to press the *leaves*, by crowding them into the Bags or Baskets. Lastly, that they *gather* only (unless in case of necessity) *leaves* from the *present*, not from the *former* years sprigs, or old *wood*, which are not only rude and harsh, but are annex'd to stubb'd Stalks, which injure the *worms*, and spoil the denuded branches.

12. This is what I thought fit to premonish concerning the gathering of the *Leaves* of this *tree* for *Silk-worms*, as I newly find it in *Monsieur Isnard's Instructions*, in that exact *Discourse* of his published some three years since, and dedicated to *Monsieur Colbert*, (who has, it seems, constituted this industrious, and experienced person, *Surveyor* of this Princely *manuſacture* about *Paris*) and because the *book* it self is rare, and known of by very few. I have no more to add, but *this* for our *encouragement*, and to encounter the *Objections* which may be suggested about the coldness, and moisture of our *Country*; That the *Spring* is in *Provence* no less *inconstant* than is ours in *England*; that the *colds* at *Paris* are altogether as *sharp*; and that when in *May* it has continued raining for *nine* and *twenty* days successively, *Monsieur Isnard* assures us, he proceeded in his *work* without the least disaster; and in the year 1664 he presented the *French King* his *Master*, with a considerable quantity of better *Silk*, than any *Messina*, or *Boulonia* could produce, which he sold raw at *Lions*, for a *Pistol* the *pound*; when that of *Avignon*, *Provence*, and *Dauphine* produc'd little above half that price. But you are to receive the compleat *History* of the *Silk-worm*, from that incomparable *Treatise*, which the learned *Italpighius* has lately sent out of *Italy*, and dedicated to the *Royal Society* as a *specimen*, and noble effect of its universal *correspondence*, and *concernments* for the improvement of *useful knowledge*. To this I add that beneficial passage of the learned *Dr. Beale*, communicated in the 12 Vol. *Philos. Transactions* N. 133. p. 816. where we find recommended the promotion of this *Tree* in *England*, from its success in several *Northern Counties*, and even in the moist places of *Ireland*: He shews how it may be improv'd by *Grafting* on the *Fig*: or the larger *black Mulberie*, on that of the *smallest* kind: Also of what request the *Diamorbon*, or *Gudenie* made of the *juice* of this *fruit*, was with the *Antients*, with other excellent observations.

C H A P. X.

Of the Service, and Black Cherry-tree.

Service. 1. *Sorbus*, the *Service-tree* (of which there are four sorts) is rais'd of the *Chequers*, or *Berries*, which being ripe (that is) rotten, about September (and the pulp rub'd off clean from the stones, in dry sand, and so kept till after Christmas) may be sown like *Beech-Mast*, educated in the *Nursery* like the *Chestnut*: It is reported that the *Sower* never sees the fruit of his labour; either for that it bears only being very old, or that *Men* are commonly so, before they think of planting *Trees*: But this is an egregious mistake; for these come very soon to be *Trees*, and being planted young, thrive exceedingly; I have likewise planted them as big as my arm successfully: The best way is therefore to propagate them of *Suckers*, of which they put forth enough, as also of *Seeds*, and may be budded with great improvement: They delight in reasonable good stiff ground, rather inclining to cold, than over hot; for in places which are too dry, they never bear kindly. The *Torminalis* is the kind most frequent with us; for those of the narrower, and less indented *Leaf*, is not so common in England as in France, bearing a sort of *Berry* of the *Pear* shape, and is there call'd the *Cormier*; this *Tree* may be *Grafted* either with it self, or on the *White-thorn*, and *Quince*. To this we might add, the *Mespilus*, or *Medlar*, being an hard wood, and of which I have seen very beautiful *Walking-staves*.

2. The *Timber* of the *Service* is useful for the *Joyner*, for the *Engraver* of *Wood-cuts*, *Bowls*, *Pulleys*, *Skrews*, *Mill-spindles* and other; *Goads* to drive *Oxen* with, &c. *Pistol*, and *Gun-stocks*, and for most that the *Wild-Pear-tree* serves; and being of a very delicate *Grain*, for the *Turner*, and divers *curiosities*, and looks delicately, and is almost everlasting, being rub'd over with *Oyl* of *Linseed*, well boyl'd, and may be made to counterfeit *Ebony*, or almost any *Indian Wood*, colour'd according to *Art*: Also it is taken to *Build* with, yielding *Beams* of considerable substance: The *shade* is beautiful for *Walks*, and the *Fruit* not unpleasant, especially the *second* kind, of which with new *Wine* and *Honey*, they make a *Conditum* of admirable effect to corroborate the *Stomach*; and the *Fruit* alone is good in *Dysentery* and *Lasky*. The *water* distill'd from the *Stalks* of the *Flowers* and *Leaves* in M. B. and twice *Rectified* upon fresh matter, is incomparable for *Consumptive* and *Tubid* Bodies, taking an *Ounce* daily at several times: Likewise it cures the *Green-sickness* in *Virgins*, and is prevalent in all *Fluxes*; distill'd warm into the *Ears* it abates the pain: The *Wood* or *Bark* contus'd, and applied to any green *Wound*, heals it; and the *Powder* thereof drank in *Oyl Olive*, consolidates inward *Ruptures*: Lastly, the *Salt* of the *Wood* taken in decoction of *Althææ*

thea to three *Grains*, is an incomparable Remedy to break, and expel *Gravel*. The *Service* gives the *Husbandman* an early preface of the approaching *Spring*, by extending his adorned *Buds* for a peculiar entertainment, and dares peep out in the severest *Winters*.

3. That I rank this amongst the *Forest Berry-bearing trees*, is *Black*, chiefly from the suffrage of that industrious Planter Mr. *Cooke*, *cherry*, from whose ingenuity and experience (as well as out of gratitude for his frequent mentioning of me in his elaborate, and useful work) I acknowledge to have benefited my self, and this *Edition*; though I have also given no obscure taste of this pretty tree in *Chap. 21. Sect. 22.*

It is rais'd of the *stones* of *Black-Cherries* very ripe (as they are in *July*) endeavouring to procure such as are full, and large; whereof some he tells us, are little inferior to the *Black Orleans*, without *grafting*, and from the very *genius* of the *Ground*. These gather'd, the *fleshy* part is to be taken off, by rolling them under a *plank* in dry sand, and when the humidity is off (as it will be in 3 or 4 days) reserve them in sand again a little moist and hous'd, 'till the beginning of *February*, when you may sow them in a light *gravelly mould*, keeping them clean for two years, and thence planting them into your *Nurseries*, to raise other kinds upon, or for *Woods*, *Coppices* and *Hedge-rows*, and for *Walks* and *Avenues*, which if of a dryish soil, mixt with *loame*, though the bottom be *Gravel*, will thrive into stately trees, beautified with *blossoms* of a surprizing whiteness, greatly relieving the tedious *Beer*, and attracting *Birds*.

If you sow them in *Beds* immediately after they are *excarnated*, they will appear the following *Spring*, and then at two years shoot 'be fit to plant out where you please; otherwise, being kept too long ere you sow them, they will sleep two *Winters*: And this is a *rule*, which he prescribes for all sorts of *Stone-fruit*.

You may almost at any time remove young *Cherry-trees*, abating the *heads* to a single shoot.

He recommends it for the *Coppice*, as producing a strong *shoot*, and as apt to put forth from the roots, as the *Elm*; especially, if you fell lusty trees: In light ground it will increase to a goodly tall tree, of which he mentions one, that held above 85 foot in height: I have my self planted of them, and imparted to my Friends, which have thriv'd exceedingly; but till now did not infer it among the *Foresters*: Concerning its other uses, see the *Chapter* and *Section* above mentioned, to which add *Pomona*, *Chap. 8.* annexed with this Treatise.

C H A P. XI.

Of the Maple.

Maple. 1. **T**HE Maple [*Acer minus*] (of which Authors (see *Salmasius* upon *Solinus*, c. 33.) reckon very many kinds) was of old held in equal estimation almost with the *Citron*; especially the *Bruscum*, the *French-Maple*, and the *Peacocks-tail Maple*, which is that sort so elegantly undulated, and crisped into variety of curls. It were a most laudable attempt, if some would enquire out, and try the planting of such sorts as are not *Indigenes* amongst us; such as is especially the *German Aier*, and that of *Virginia*, not yet cultivated here, but an excellent Tree: And if this were extended to other *Timber*, and *exotic* Trees likewise, it would prove of extraordinary benefit and Ornament to the *Publick*, and were worthy even of the *Royal Care*. They are all produced of the *Keys*, like the *Ash*, (after a years interment) and like to it, affect a found, and a dry mould; growing both in *Woods* and *Hedge-rows*, especially in the latter; which if rather hilly, than low, affords the fairest *Timber*. It is also propagated by *Layers*, and *Suckers*. By shredding up the boughs to a head, I have caused it to shoot to a wonderful height in a little time; but if you would lop it for the *fire*, let it be done in *January*; and indeed it is observ'd to be of noxious influence, to the subnascent plants of other kinds, by reason of a clammy Dew which it sheds upon them, and therefore they would not be indulg'd in *Pollards*, or spreading Trees, but to thicken *Under-woods* and *Copse*. The *timber* is far superiour to *Beech* for all uses of the *Turner*, who seeks it for *Dishes*, *Cups*, *Trays*, *Trenchers*, &c. as the *Joyner* for *Tables*, *Inlayings*, and for the delicateness of the *grain*, when the *knurs*, and *nodosities* are rarely diaped, which does much advance its price. Also for the lightness (under the name *Aier*) employ'd often by those who make *Musical Instruments*: There is a larger sort, which we call the *Cycamor*.

2. But the description of this lesser *Maple*, and the ancient value of it, is worth the citing. *Acer operum elegantia, & subtilitate Cedro secundum; plura ejus genera: Album, quod precipui candoris vocatur Gallicum: In Transpadana Italia, transque Alpes nascent. Alterum genus, crispo macularum discursu, qui cum excellentior fuit, à similitudine cande pavonum nomen accepit.* The *Maple* (says *Pliny*) for the elegance, and fineness of the wood, is next to the very *Cedar* it self: There are several kinds of it, especially the *White*, which is wonderfully beautiful; this is call'd the *French-Maple*, and grows on that part of *Italy*, that is on the other side of *Po* beyond the *Alpes*: The other has a curl'd grain, so curiously maculated, that from a near resemblance, it was usi-

ally

ally call'd the *Peacocks-tail*, &c. He goes on to commend that of *Istria*, and that growing on the Mountains for the best: But in the next Chapter; *Puleherimum vero est Bruscum, multoque excellentius etiamnum Molluscum, ubi utrumque arboris ejus. Bruscum intortitis crispum, Molluscum simplicius sparsum; Et si magnitudinem mensurarum caperet. haud dubie præferretur Cedro, nunc intra pugillares, leetiorumque siccios aut laminas. &c. & Brusco sunt mensæ nigrescentes.* &c. *Plin.* l. 16. c. 15, 16. The *Bruscum*, or *Knur* is wonderfully fair, but the *Molluscum* is counted most precious; both of them *Knobs* and swellings out of the Tree. The *Bruscum* is more intricately crisp'd; the *Molluscum* not so much; and had we Trees large enough to saw into *Planks* for *Tables*, 'twould be prefer'd before *Cedar* (or *Citron*, for so some Copies read it) but now they use it only for small *Table-books*, and with its thin boards to *Wainscot Bed-Testers* with, &c. The *Bruscum* is of a blackish kind, with which they make *Tables*. Thus far *Pliny*. And such spotted *Tables* were the famous *Tigrin*, and *Pantherine* Curiosities of; not to call'd from being supported with figures carved like those Beasts, as some conceive, and was in use even in our *Grandfathers* days, but from its natural Spots and maculations, *hem, quantis facultatibus estimare lignæ maculas!* as *Tertullian* cries out, *de Pallio*, c. 5. such a *Table* was that of *Cicero's*, which cost him 10000. *Sesterces*; such another had *Asinius Gallus*. That of *King Juba* was sold for 15000. and another which I read of, valu'd at 140000 *H. S.* which at about 3 *d. sterling*, arrives to a pretty Sum; and yet that of the *Mauritanian Ptolomie*, was far richer, containing four *Foot* and an half diameter, three *Inches* thick, which is reported to have been sold for its weight in *Gold*: Of that value they were, and so madly luxurious the age, that when they at any time reproach'd their *Wives* for their wanton Expensiveness in *Pearl* and other rich trifles, they were wont to retort, and turn the *Tables* upon their *Husbands*. The *Knot* of the *Timber* was the most esteem'd, and is said to be much resembled by the *Female Cypress*; we have now, I am almost persuaded, as beautiful *Planks* of some *Walnut-trees*, near the *Root*; and *Tew*, *Ivy*, *Rose-wood*, *Ash*, *Thorn*, and *Olive*, I have seen incomparable pieces; but the great Art was in the *Seasoning*, and *Politure*; for which last, the rubbing with a *Mans hand* who came warm out of the *Bath*, was accounted better than any Cloth, as *Pliny* reports. Some there be who contend, this *Citern* was a part near the *Root* of the *Cedar*, which, as they describe that, is very *Oriental* and *Odoriferous*, but most of the Learned favour the *Citern*, and that it grew not far from our *Tangier*, about the foot of *Mount Atlas*, whence haply some industrious *Perion* might procure of it from the *Moors*; and I did not forget to put his then Excellency my Lord *H. Howard* (now his *Grace the Duke of Norfolk*) in mind of it, who I hoped might have opportunities of satisfying our Curiosity, that by comparing it with those elegant *Woods*, which both our own *Countries*, and the *Indies* furnish, we might pronounce something in the Controversie: But his not going so far

far into the *Country*, and disorder which happen'd at his being there, quite frustrated this expectation: Here I think good to add, what honest *Palissy* Philosophises after his plain manner, about the *reason* of those pretty *undulations* and *chamfers*, which we so frequently find in diverse *Woods*, which he takes to be the *descent*, as well as *ascent* of *Moisture*: For what else (says he) becomes of that *water* which we often encounter in the *Cavities*, when many branches *divaricate*, and spread themselves at the *tops* of great *Trees* (especially *Pollards*) unless (according to its natural appetite) it sink into the very *Body* of the *Stem* through the *Pores*? For example, in the *Walnut*, you shall find, when 'tis old, that the *Wood* is admirably figur'd, and as it were marbl'd, and therefore much more esteemed by the *Joiners*, *Cabinet-makers*, &c. than the *Young*, which is paler of *Colour*, and without any notable *Grain*, as they call it. For the *Rain* distilling along the *Branches*, when many of them break out into clusters from the *stem*, sinks in, and is the *Cause* of these *marks*; since we find it exceedingly full of *pores*: Do but plane off a thin *chip*, or *slider* from one of these old *Trees*, and interposing it 'twixt your *Eye* and the *Light*, you shall observe it to be full of innumerable *holes* (much more perspicuous and ample, by the application of a good *Microscope*.) But above all, notable for these extravagant *Damaskings* and *Characters*, is the *Maple*; and 'tis notorious, that this *Tree* is very full of *Branches* from the *Root* to its very *Summit*, by reason that it produces no considerable *Fruit*: These *Arms* being frequently cut, the *Head* is more surcharged with them, which spreading like so many *Raies* from a *Center*, form that *hollowness* at the top of the *Stem* whence they shoot, capable of containing a good quantity of *Water* every time it *Rains*: This sinking into the *pores*, as was before hinted, is compell'd to divert its course as it passes through the *Body* of the *Tree*, where-ever it encounters the *knot* of any of those *Branches* which were cut off from the *stem*; because their *Roots* not only deeply penetrate towards the *heart*, but are likewise of themselves very *hard* and *impervious*; and the frequent *obliquity* of this *Course* of the subsiding *moisture*, by reason of these obstructions, is, as may be conceived, the cause of those curious *works*, which we find remarkable in *this*, and other *Woods*, whose *Branches* grow thick from the *Stem*: but for these curious *contextures*, consult rather the learned *Dr. Grem.* We have shew'd how by *Culture*, and stripping up, it arrives to a goodly *Tree*; and surely, there were some of them of large bulk, and noble *Shades*, that *Virgil* should choose it for the *Court* of his *Evander*, one of his *Worthiest Princes*, in his best of *Poems*, sitting in his *Maple-Throne*; and when he brings *Aeneas* into the *Royal Cottage*, he makes him this memorable *Complement*; Greater, says great *Cowley*, than ever was yet spoken at the *Escorial*, the *Louvre*, or *Whitehal*.

This humble Roof, this Rustique Court, find he,
Receiv'd Alcides crown'd with Victorie:
Scorn not (great Goss) the steps where he has trod,
But concern Hamlet, and imitate a God.

—Hec (inquit) limina Virum
Alcides ———

C H A P. XII.

Of the Sycomor.

1. THE *Sycomor*, falsely so called, is, our *Acer majus*, one of *Sycomor*. the *Maples*, and is much more in reputation for its *shade* than it deserves; for the *Hony-dew*:aves, which fall early (like those of the *Ash*) turn to *Mucilage* and noxious *insects*, and putrifie with the first *moisture* of the season; so as they contaminate and marr our *Walks*, and are therefore by my consent, to be banish'd from all curious *Gardens* and *Avenues*. 'Tis rais'd of the *Keys* (as soon as ripe) they come up the first *Spring*; also by *Roots*, and *Layers*, in ground moist, not over-wet or stiff, and to be govern'd, as other *Nursery-Plants*.

2. There is in *Germany* a better sort of *Sycomor* than ours, wherewith they make *Saddle-trees*, and divers other things of use; our own is excellent for *Trenchers*, *Carts*, and *Plow-timber*, being light, tough, and not much inferior to *Ash* it self; and if the *trees* be very tall and handsome, are the more tolerable for distant *Walks*, especially, where other better trees prosper not so well, or where a sudden *shade* is expected: Some commend them to thicken *Coppices*, especially in *Parks*, as least apt to the spoil of *Deer*, and that it is good *fire-wood*. This *Tree* being wounded, bleeds a great part of the *Year*; and the *Liquor* emulating that of the *Birch*, which for hapning to few of the rest (that is, to bleed *Winter* and *Summer*) I therefore mention.

C H A P. XIII.

Of the Horn-beam.

1. O Strys the *Horn-beam*, in *Latine* (ignorantly) the *Carpinus*, is *Horn-planted* of *Sets*; though it may likewise be rais'd from the *beam*. *Seeds*, which being mature in *August*, should be sown in *October*; and will lie a year in the *bed*, which must be well, and carefully shaded so soon as they peep: but the more expeditious way is by *Layers* or *Sets*, of about an inch *diameter*, and cae within half a foot of the earth: thus it will advance to a considerable *Tree*. The places it chiefly desires to grow in are in cold *hills*, stiff ground, and in the barren, and most expos'd parts of *woods*.

2. Amongst other uses which it serves for, as *Mill-cogs*, &c. (for which it excels either *Tew* or *Crab*) *Toak-timber* (whence of old,

old, and for that it was as well *flexible*, as *tough*, 'twas called *ζυγία*) Heads of *Beetles*, Stocks and Handles of *Tools*; It is likewise for the *Turners* use excellent: Good *Fire-wood*, where it burns like a *candle*, and was of old to employ'd;

Carpinus tædas fissâ facêsq; dabit.

(For all which purposes its extream toughness and whiteness commends it to the *Husbandman*.) Being planted in small *Fosses* or *Trenches*, at half a foot *interval*, and in the single row, it makes the noblest, and the steepest *Hedges* for long *Walks* in *Gardens*, or *Parks*, of any Tree whatsoever whose leaves are *deciduous*, and forsake their Branches in *Winter*; because it grows tall, and so sturdy, as not to be wronged by the *Winds*: Besides, it will furnish to the very foot of the *Stem*, and flourishes with a glossie and polish'd *verdure* which is exceeding delightful, of long continuance, and of all other the harder Woods, the speediest Grower; maintaining a slender, upright *stem*, which does not come to be bare and sticky in many years; it has yet this (shall I call it) *infirmity*, that keeping on its *leaf* till new ones thrust them off, 'tis clad in *ruffet* all the winter long. That admirable *Espalier-hedge* in the long middle walk of *Luxembourg Garden* at *Paris* (than which there is nothing more graceful) is planted of this Tree; and so is that *Cradle*, or *Closet walk*, with that perplex *Canopy*, which covers the seat in his *Majesties Garden* at *Hampton-Court*. These *Hedges* are *unsple*; but where they are maintain'd to fifteen, or twenty foot height (which is very frequent in the places before mention'd) they are to be cut, and kept in order with a *Sythe* of four foot long, and very little *falcated*; this is fix'd on a long *sweed* or straight handle, and does wonderfully expedite the trimming of *these*, and the like *Hedges*. Of all the *Foresters* this preserves it self best from the bruttings of *Deer*, and therefore to be kindly entertain'd in *Parks*: But the reason why with us, we rarely find them ample and spreading, is, that our *Husbandman* suffers too large and grown a *lop*, before he cuts them off, which leaves such gally *wounds*, as often proves exitial to the Tree, or causes it to grow deform'd and hollow, and of little worth but for the fire; whereas, were they oftner taken off, when the *lops* were younger, though they did not furnish so great *Wood*, yet the continuance, and flourishing of the Tree, would more than recompence it; For this cause,

3. They very frequently plant a *Clump* of these *Trees* before the Entries of most of the great *Towns* in *Germany*, to which they apply *Timber-Frames* for convenience, and the *People* to sit, and solace in. *Scamozzi* the *Architect*, says, that in his time, he found one whose Branches extended seventy foot in breadth: This was at *Vuimsen* near the *Necker*, belonging to the Duke of *Witemberg*: But that which I find planted before the Gates of *Strasburg*, is a *Platanus*, and a *Lime-tree* growing hard by one another, in which is erected a *Pergola* eight foot from the ground, of fifty foot wide, having

having ten *Arches* of twelve foot height, all shaded with their foliage; and there is besides this, an *Over-grown Oak*, which has an *Arbour* in it of 60 foot diameter: hear we *Rapinus* describe the use of our *Horn-beam* for *these*, and other Elegancies.

In Walks the Horn-beam stands, or in a Maze
Through thousand self-entangling Labyrinths strays:
So clasp the Branches lopp'd on either side,
As though an Alley did two walks divide:
This Beauty found, Order did next adorn
Which Bought into a thousand figures born,
Which pleasing Objects weariness therr'd,
Your feet into a wilderness convey'd.
Nor better Leaf on twining Arbor spread,
Against the scorching Sun to shield your head.

In traxius longos facilis tibi Carpinus ibit,
Mille per erroris, indrehensque recessus,
Et molles tendens fello seu pariete ramos,
Præbuit visidem diverso è margine scenam.
Primus hunc illi quendam, post additus ordo est,
Attonesque domus, & formis quæstia volutas
Innumera, surtoque vides, oblique recessu:
In traxius aëta est longos & opaca viruta.
Quintiam egregia tendens imbracula frondis
Temperat ardentis ramis ingentibus ætus.

CHAP. XIV.

Of the Lime-Tree.

The *Lime-tree*, or [*Linden*] is of two kinds; the *Male Lime-Tree* (which some allow to be but a finer sort of *Elm*) is harder, fuller of knots, and of a redder colour; but producing neither *Flower*, nor *Seed*, (so constantly and so mature with us) as does the *Female*, whose *Blossom* is also very odoriferous, perfuming the *Air*: The *Wood* is likewise thicker, of small pith, and not obnoxious to the *Worm*, so as it seems *Theophrastus*, de Pl. l. 3. c. 10. said true, that though they were of both Sexes, διαφέρουν δὲ τῇ ὑπόψει τῇ ὁσμῇ &c. yet they totally differ'd as to their form. We send commonly for this Tree into *Flanders* and *Holland*, to our excessive cost; while our own *Woods* do in some places spontaneously produce them, and though of somewhat a smaller leaf, yet altogether as good, apt to be *civiliz'd*, and made more *leasid*. From thence I have received many of their *Berries*; so as it is a shameful negligence, that we are no better provided of *Nurseries*, of a Tree so choice, and universally acceptable. For so they may be rais'd either of the *Seeds* in *October*, or (with better success) by the *Suckers*, and *Plants*, which are treated after the same *method*, and in as great abundance as the *Elm*, like to which it should be cultivated. You may know whether the *Seeds* be *prolific*, by searching the *husk*, if biting, or cutting it in funder it be *full* and *white*, and not *husky*, as sometimes we find the *Forrainers*: Be sure to collect your *Seeds* in dry weather, airing it in an open room, and reserving it in *sand*, (as has been taught) till mid *February*, when you may sow it in pretty strong, fresh and *loamy mould*, kept shaded, and moist as the season requires, and clear of *Weeds*, and at the period of two years, plant them out, dress'd and prun'd as discretion shall advise. But not only by the *Suckers* and *Layers*,

at the *Roots*, but even by *Branches* lop'd from the head, may this *Tree* be propagated; and peeling off a little of the *Bark*, at a competent distance from the *Stem* or *Arms*, and covering it with *Loam* mingled with rich *Earth*, they will shoot their *fibers*, and may be feasonably separated: But to facilitate *this* and the like attempts, it is advisable to apply a *ligature* above the place, when the *Sap* is *ascending*, or beneath it, when it (as they say vulgarly) *descends*. From *June* to *November* you may lay them; the *Serubs* and less erect, do excellently to thicken *Coppes*, and will yield lusty shoots, and useful *fire-wood*.

2. The *Lime-tree* affects a rich feeding loamy Soil; in such Ground their growth will be most incredible for speed and spreading. They may be planted as big as ones Leg; their *Heads* topp'd at about six or eight foot *bole*; thus it will become (of all other) the most proper, and beautiful for *Walks*, as producing an upright *Body*, smooth and even *Bark*, ample *Leaf*, sweet *Blossom*, and a goodly *shade* at distance of eighteen, or twenty foot. They are also very patient of *pruning*; but if it taper over much, some of the collateral bows would be spar'd, to check the *Sap*, which is best to be done about *Midsummer*; and to make it grow upright, take off the *prepondering* branches with discretion, and so you may correct any other *Tree*, and redress its obliquity.

The *Root* in transplanting would not be much lop'd; and this (says Mr. Cook) is a good lesson for all young planted *Trees*.

3. The *Prince Elektor* did lately remove very great *Lime-trees* out of one of his *Forests*, to a steep Hill, exceedingly expos'd to the heat of the *Sun* at *Hidelbourg*; and that in the midst of *Summer*: They grow behind that strong *Tower* on the *South-west*, and most torrid part of the eminence; being of a dry, reddish barren *Earth*; yet do they prosper rarely well: But the *Heads* were cut off, and the *Pits* into which they were transplanted, were (by the industry, and direction of *Monsieur de Son*, a *Frenchman*, and admirable *Mechanican*, who himself related it to me) fill'd with a composition of *Earth* and *Cow-dung*, which was exceedingly beaten, and so diluted with *Water*, as it became almost a liquid *pap*: It was in *this*, that he plunged the *Roots*, covering the surface with the *Turf*: A singular example of removing so great *Trees* at such a *season*, and therefore by me taken notice of here expressly. Other perfections of the *Tree* (besides its unparallel'd beauty for *Walks*) are that it will grow in almost all grounds: That it lasts long; that it soon *heals* its *Scars*; that it affects *uprightness*; that it stoutly resists a *storm*; that it seldom becomes *hollow*.

4. The *Timber* of a well grown *Lime* is convenient for any use that the *Willow* is; but much to be prefer'd, as being both stronger, and yet lighter; whence *Virgil* calls them *tilias leves*; and therefore fit for *Tokes*, and to be turn'd into *Boxes* for the *Apothegaries*; and *Columella* commends *Arculus tiliaceas*. And because of its *Colour*, and easie working, and that it is not subject to split, *Architects* make with it *Modells* for their designed *Buildings*;

ings; and small *Statues*, and little curious *Figures* have been Carved of this *wood*. With the *twigs*, they made *Baskets*, and *Cradles*, and of the smoother side of the *Bark*, *Tablets* for *Writing*; for the ancient *Philyra* is but our *Tilia*. *Bellonius* says, that the *Grecians* made *Bottles* of it, which they finely *Rezin'd* within-side, so likewise for *Pumps* of *Ships*, also *Lattices* for *Windows*. The *Gravers* in *Wood* do sometimes make use of this fine *material*; and even the coarsest *membrane*, or *Sivers* of the *Tree* growing 'twixt the *Bark* and the main *Body*, they now twist into *Bastropes*; Besides the *Truncheons* make a far better *Coal* for *Gun-powder* than that of *Alder* it self: And the extraordinary *candor* and *lightness*, has dignify'd it above all the *Woods* of our *Forest*, in the hands of the Right Honourable the *White Slave* Officers of His *Majesties* Imperial Court. Those royal *Plantations* of these *Trees* in the *Parks* of *Hampton-Court*, and *St. James's*, will sufficiently instruct any man how these (and indeed all other *Trees* which stand single) are to be govern'd, and defended from the injuries of *Beasts*, and sometimes more unreasonable *Creatures*, till they are able to protect themselves. In *Holland* (where the very *High ways* are adorn'd with them) they frequently clap three, or four *Deal-boards* (in manner of a close trunk) about them; but it is not so well; because it keeps out the *Air*, which should have free access, and intercourse to the *bole*, and by no means be excluded from flowing freely about them, or indeed any other *Trees*; provided they are secur'd from Cattel and the violence of impetuous winds, &c. as his *Majesties* are, without those close *Coffins*, in which the *Dutch-men* seem rather to bury them alive: In the mean time, is there a more ravishing, or delightful object than to behold some intire *streets*, and whole *Towns* planted with these *Trees*, in even lines before their doors, so as they seem like *Citties* in a *Wood*? This is extremely fresh, of admirable effect against the *Epilepsie*, for which the delicately scented *blossoms* are held prevalent, and skreen the Houses both from *Winds*, *Sun*, and *Dust*; than which there can be nothing more desirable where *Streets* are much frequented. For thus

The stately *Lime*, smooth, gentle, straight, and fair,
(With which no other *Dryad* may compare)
With verdant locks, and fragrant Blossoms deckt,
Does a large, ev'n, odorate-Shade project.

Stat Philyra: haud omnes formosior altera sorgit
Inter Hamadryades; mollissima, candida, levis,
Et vivida comae, & hirsutius flore sapibus,
Spargit odoratum latè, atque aequalitè umbram.

Coulci l. 6. Pl.

The distance for *Walks* may in rich ground, be eighteen foot, in more ordinary Soil, fifteen, or sixteen. For a most prodigious *Tree* of this kind, see *Chap. 30. Sect. 10.*

The *Berries* reduc'd to powder, cure the *Dysenterie*, and stop blood at the nose: The distill'd-water good against the *Epilepsie*, *Apoplexie*, *Hertigo*, trembling of the *Heart*, *Gravel*; *Schroder* commends a mucilage of the *bark* for wounds, repellens *urinam*, & *Menses cients*, &c.

C H A P. XV.

Of the Quick-Beam.

Quick-beam.

1. **T**HE Quick-beam [*Ornus*, or as the *Pinax* more peculiarly, *Fraxinus bubula*, others, the *Wild Sorb*] or (as some term it) the *Witcher*, is a species of wild-Ash. The berries which it produces in *October*, may then be sown; or rather the *Seeds* planted: I have store of them in a warm *Grove* of mine, and 'tis of singular beauty: It rises to a reasonable stature, shoots upright, and slender; and consists of a fine smooth bark. It delights to be both in *Mountains* and *Woods*, and to fix it self in good light ground; *Virgil* affirms, 'twill unite with the *Pear*.

2. Besides the use of it for the *Husbandmans Tools*, *Goads*, &c. the *Wheelwright* commends it for being all heart; if the tree be large, and so well grown as some there are, it will saw into *Planks*, *Boards* and *Timber*, (vide chap. 30. sect. 10.) and our *Fletchers* commend it for *Bowes* next to *Tew*, which we ought not to pass over, for the glory of right *English* Ancestors: In a *Statute* of *Hen. 8.* you have it mention'd: It is excellent *Fuel*; but I have not yet observed any other use, save that the *Blossoms* are of an agreeable scent, and the *Berries* such a tempting Bait for the *Thrushes*, that as long as they last, you shall be sure of their Company: Some highly commend the *Juice* of the berries, which (fermenting of it self) if well preserv'd, makes an excellent Drink, against the *Spleen* and *Scorbut*: *Ale* and *Beer* brew'd with these *Berries*, being ripe, is an incomparable Drink, familiar in *Wales*, where this *Tree* is reputed so sacred, that as there is not a *Church-yard* without one of them planted in them (as among us the *Tew*) so on a certain day in the year, every body religiously wears a *Cross* made of the wood, and the *Tree* is by some *Authors* call'd *Fraxinus Cambro-Britannica*.

C H A P. XVI.

Of the Birch.

Birch.

1. **T**HE Birch [*Betula*, in *British* Bedw, doubtless a proper *Indigene* of *England*, though *Pliny* call it a *Gaulish* tree] is altogether produc'd of *Roots* or *Suckers*, (though it sheds a kind of *Samara* about the *Spring*) which being planted at four or five foot interval, in small *Twigs*, will suddenly rise to *Trees*; provided they affect the ground, which cannot well be too Barren; for it

it will thrive both in the *Dry*, and the *Wet*, *Sand*, and *Stony*, *Marshes*, and *Bogs*; the *Water-galls*, and *uliginous* parts of *Forests* that hardly bear any *Grass*, do many times spontaneously produce it in abundance, whether the place be high, or low, and nothing comes amiss to it. Plant the small *Twigs*, or *Suckers* having *Roots*, and after the first year, cut them within an *inch* of the surface; this will cause them to sprout in strong and lusty *tufts*, fit for *Coppice*, and *Spring-woods*; or, by reducing them to one stem, render them in a very few years, fit for the *Turner*. For

2. Though *Birch* be of all other the worst of *Timber*, yet has it its various uses, as for the *Husbandmans Ox-jokes*; also for *Hoops*, small *Screws*, *Paniers*, *Brooms*, *Wands*, *havin-bands*, and *Wythes* for *Fagots*; and claims a memory for *Arrows*, *Bolts*, *Shafts*, our old *English* Artillery; also for *Disbes*, *Bowles*, *Ladles*, and other domestic Utensils, in the good old days of more simplicity, yet of better and truer Hospitality. In *New-England* our Northern Americans make *Canoos*, *Boxes*, *Buckets*, *Kettles*, *Disbes*, which they sow, and joyn very curiously with thread made of *Cedar roots*, and divers other domestical Utensils, as *Baskets*, *Baggs* with this *Tree*, whereof they have a blacker kind; and out of a certain Excrecence from the *Bole*, a *Fungus*, which being boil'd, beaten and dry'd in an *Oven* makes excellent *Spunck* or *Touch-wood*, and *Balls* to play withal: They make also not only this small ware, but even small-Craft *Pinnaces* of *Birch*, ribbing them with white *Cedar*, and covering them with large flakes of *Birch* bark, sow them with thread of *Spruce-roots*, and pitch them, as it seems we did even here in *Britain*, as well as the *Venetis*, making use of the *Willow*, whereof *Lucan*,

When *Scotis* to his own banks resor'd,
Had quit the field, of *Twigs*, and *willow* board
They build small *Crafts*, cover'd with *Bullocks* hide,
In which they reach'd the *Rivers* farther side:
So sail the *Veneti* if *Padus* flow,
The *Britains* sail on their rough *Ocean* so.

*Primum cana salix madefacta uiminet, paruum
Troster in populo, celsaque tenduta iuuenes;
Vetoris patris, turridum super ostiat annum.
Sic Venetus flagrantis Vado, seseque Britannus
Nauigat Oceano.*

Also for *Fuel*, great and small *Coal*, which last is made by charring the slenderest brush, and summities of the twigs; as of the *Tops* and loppings Mr. *Howards* new *Tanne*. The inner silken-bark was anciently us'd for *Writing-Tables*, even before the Invention of *Paper*; and with the out-ward thicker, and couler part, are divers *Houles* in *Russia*, *Poland* and those poor Northern *Tracts* cover'd, in stead of *Slates* and *Tyle*: 'Tis affirm'd by *Cardan*, that some *Birch-roots* are so very extravagantly vein'd, as to represent the Shapes and Images of *Beasts*, *Birds*, *Trees*, and many other pretty resemblances. Lastly, of the whitest part of the old Wood, found commonly in doating *Birches*, is made the grounds of our *Farin'd Gallants sweet Powder*; and of the quite consum'd and rooten (such as we find reduc'd to a kind of reddish Earth in *superexannated* hollow-trees) is gotten the best Mould for the raising of divers *Seedlings* of the rarest *Plants* and *Flowers*; to say nothing here of the *Magisterial Fases*, for which antiently the *Cudgels* were us'd by the *Lithor*, as now the gentler *Rods* by our tyrannical *Pedagogues*.

3. I should here add the *uses* of the *Water* too, had I full permission to tamper with all the *Medicinal* virtues of *Trees*: But if the sovereign effects of the *Juice* of this despicable *Tree* supply its other defects (which makes some judge it unworthy to be brought into the *Catalogue of Woods* to be propagated) I may perhaps for once, be permitted to play the *Empiric*, and to gratify our laborious *Wood-man* with a Draught of his own *Liquor*; And the rather, because these kind of *Secrets* are not yet sufficiently cultivated; and ingenious *Planters* would by all means be encourag'd to make more *trials* of this nature, as the *Indians*, and other *Nations* have done on their *Palmes*, and *Trees* of several kinds, to their great emolument. The *Mystery* is no more than this: About the beginning of *March* (when the *Buds* begin to be proud and turgid, and before they explain into *leaves*) with a *Chisel* and a *Mallet*, cut a *slit* almost as deep as the very *Pith*, under some bough, or branch of a well-spreading *Birch*; cut it *oblique*, and not *long-ways* (as a good *Chirurgion* would make his *orifice* in a *Vein*) inserting a small *stone* or *chip*, to keep the *Lips* of the wound a little open. Sir *Hugh Plat*, giving a general Rule for the gathering of *Sap*, and *Tapping* of *Trees*, would have it done within one foot of the ground, the first *rind* taken off, and then the white *Bark* slit overthwart, no farther than to the *Body* of the *Tree*: Moreover, that this *wound* be made only in that part of the *bark* which respects the *South-west*, or between those quarters; because (says he) little, or no *Sap* riseth from the *Northern*. In this *slit*, by the help of your *knife* to open it, he directs that a *leaf* of the *Tree* be inserted, first fitted to the dimensions of the *slit*, from which the *Sap* will distil in manner of *filtration*: Take away the *leaf*, and the *bark* will close again, a little *Earth* being clapped to the *slit*: Thus the *Knight* for any *Tree*: But we have already shew'd how the *Birch* is to be treated: Fasten therefore a *Bottle*, or some such convenient *Vessel* appendant: This does the effect as well as *perforation* or *tapping*: Out of this aperture will extil a *limpid* and clear *Water*, retaining an *obscure smack* both of the *tast* and *odor* of the *Tree*; and which (as I am credibly inform'd) will in the space of *twelve*, or *fourteen* days, *preponderate*, and *out-weigh* the whole *Tree* it self, *Body*, and *Roots*; which if it be constant, and so happen likewise in other *trees*, is not only stupendous, but an experiment worthy the Consideration of our profoundest *Philosophers*: *an ex sola aqua sunt Arboree*? whether *Water* only be the Principle of *Vegetables*, and consequently of *trees*: I say, I am credibly inform'd; and therefore the late unhappy * *angry-man* might have spar'd his *Animadversion*: For he that said but twenty *Gallons* run, does he know how many more might have been gotten out of larger apertures, at the insertion of every *branch*, and *foot* in the principal *Roots* during the whole season? But I conceive I have good *Authority* for my assertion, out of the *Author* cited in the *Margin*, whose words are these: *Si mense Martio perforaveris Betulam, &c. extillabit aqua limpida clara, & pura, obscurum Arboris saporem & odorem referens, quae spacio 12 aut 14 die-*

* Dr. Stubb.
See the *Præfate*
intitl'd *Ad-*
versus *novum ad-*
versus *Sym-*
ptomaticæ & Anti-
pathicæ causas
invenientes,
per principia
Philosophicæ na-
turalis, & Fir-
monum un-
iversæ anat-
omiæ hanc,
per S. Raterij,
M. D. Glas-
gowi, 1658.
p. 55.

rum,

rum, præponderabit Arbori cum Ramis & Radicibus, &c. His exceptions about the beginning of *March* are very insignificant; since I undertake not *punctualitie* of *time*; and his own *pretend-*ed experience shew'd him, that in *hard weather* it did not run till the *expiration* of the *Month*, or beginning of *April*; and another time, on the tenth of *February*, and usually he says, about the twenty fourth day, &c. at such *uncertainty*: what im-*mane difference* then is there between the twenty fourth of *Feb.* and commencement of *March*? Evident it is, that we know of no *Tree* which does more copiously attract, be it that so much cele-*brated Spirit* of the *World* (as they call it) in Form of *Water* (as some) or a certain *specificque liquor* richly *impregnated* with this *Balsamical* property: That there is such a *Magnes* in this simple *Tree* as does manifestly draw to it self some *occult*, and wonderful *virtue*, is notorious; nor is it conceivable, indeed, the difference between the efficacy of that *Liquor* which distills from the *Bole*, or parts of the *Tree* nearer to the *Root* (where Sir *Hugh* would cele-*brate the Incision*) and that which weeps out from the more sublime *Branches*, more impregnated with this *Astral* Virtue, as not so near the *Root*, which seems to attract rather a cruder, and more com-*mon mater*, through fewer *strainers*, and neither so pure, and *Aerial* as in those refined *percolations*, the nature of the *Places* where these *Trees* delight to grow (for the most part *lofty*, *dry*, and *barren*) consider'd. But I refer these *Disquisitions* to the *Learned*; especially, as mention'd by that incomparable *Philoso-**pher*, and my most noble Friend, the honourable Mr. *Boyle*, in his *Second part* of the usefulness of *Natural Philosophy* Sect. 1. *Essay 3^d*. where he speaks of the *Manna del Corpo*, or *Trunk-Manna*, as well as of that *Liquor* from the *bough*; also of the *Sura* which the *Coco-trees* afford; and that *Polonian* secret of the *Liquor* of the *Walnut-tree* *Root*; with an encouragement of more frequent *Ex-**periments* to educe *saccharine* substances upon these occasions: But the *Book* being publish'd so long since this *Discourse* was first *Printed*, I take only here the liberty to refer the *Reader* to one of the best *Entertainments* in the world.

4. But whilst the *Second Edition* was under my hand, there came to me divers *Papers* upon this *subject* experimentally made by a worthy *Friend* of mine, a *Learned* and most industrious Per-*son*, which I had here once resolv'd to have publish'd, according to the generous liberty granted me for so doing; but understand-*ing* he was still in pursuit of that *useful*, and curious *secret*, I chang'd my resolution into an earnest address, that he would *communicate* it to the *World* himself, together with those other excellent *Enquires*, and observations which he is adorning for the benefit of *Planters*, and such as delight themselves in those inno-*cent Rusticities*. I will only by way of *Corollarie*, hint some par-*ticulars* for satisfaction of the *Curious*; and especially that we may in some sort gratify those earnest *suggestions*, and *Queries* of the late most obliging Publisher of the *Philosophical Transactions*, to whose *indefatigable pains* the *Learned World* has been infinitely engag'd.

engag'd. In compliance therefore to his *Queries*, Monday Octob. 19. 1668. Numb. 40 p. 797, 821, &c. these *Generals* are submitted: That in such *Trials* as my *Friend* essay'd, he has not yet encountered with any *Sap* but what is very clear and sweet; especially that of the *Sycamor*, which has a *dulcoration* as if mixed with *sugar*, and that it runs one of the earliest: That the *Maple* distill'd when quite rescind'd from the *Body*, and even whilst he yet held it in his hand: That the *Sycamor* ran at the *Root*, which some days before yielded no *Sap* from his *branches*; the *Experiment* made at the end of *March*: But the accurate knowledge of the nature of *Sap*, and its *periodic* Motions, and properties in several *Trees*, should be observed by some at entire *leisure* to attend it daily, and almost continually, and will require more than any one persons industry can afford: For it must be enquir'd concerning every *Tree*, its *age*, *soyl*, *situation*, &c. the variety of its ascending *Sap* depending on it; and then of its *Sap* ascending in the *branches*; and *Roots*; descending in cut *branches*; descending from *Root*, and not from *branches*; the *Seasons*, and difference of *time* in which those *Accidents* happen, &c. He likewise thinks the best expedient to procure store of *Liquor*, is, to cut the *Trees* almost quite through all the *Circles*, on both sides the *Pith*, leaving only the outmost *Circle*, and the *barks* on the *North*, or *North-East* side unpierced; and this *hole*, the larger it is bored, the more plentifully 'twill distill; which if it be *under*, and *through* a large *Arm*, near the *Ground*, it is effected with greatest advantage, and will need neither *stone*, nor *Chip* to keep it open, nor *Spigot* to direct it to the *Recipient*. Thus it will in a short time, afford *Liquor* sufficient to *Brew* with; and in some of these sweet *Saps*, one *Bushel* of *Mault*, will afford as good *Ale*, as four in ordinar *Waters*, even in *March* it self; in others, as good as two *Bushels*; for *this*, preferring the *Sycamor* before any other: But to preserve it in best condition for *brewing*, till you are stored with a sufficient quantity, it is advis'd that what first runs, be *insolated* and placed in the *Sun*, till the remainder be prepar'd, to prevent its growing *scum*: But it may also be *fermented* alone, by such as have the *Secret*: To the *Curious* these *Essays* are recommended: That it be immediately stopp'd up in the *bottles* in which it is gathered, the *Corks* well wax'd, and expos'd to the *Sun*, till (as was said) sufficient quantity be run; then let so much *Rye-bread* (toasted very dry, but not burnt) be put into it, as will serve to set it a *working*; and when it begins to ferment, take it out, and *Bottle* it immediately. If you add a few *Cloves*, &c. to steep in it, 'twill certainly keep the *year* about: 'Tis a wonder how speedily it extracts the *tast*, and *insinure* of the *Spice*: Mr. Boyle proposes a *sulphurous* fume to the *bottles*: *Spirit of Wine* may haply not only preserve, but advance the *Vertues* of *Saps*; and *Infusions* of *Raisins* are obvious, and without decoction best, which does but spend the more delicate parts. Note that the *Sap* of the *Birch*, will make excellent *Mead*.

5. To these *Observations*, that of the *Weight*, and *Vertue* of the several *Juices* would be both useful and *Curious*: As whether that

that which proceeds from the *bark*, or between *that* and the *Wood* be of the same nature, with that which is suppos'd to spring from the pores of the woody *Circles*; and whether it rise in like quantity upon comparing the *incisures*? All which may be try'd, first attempting through the *bark*, and saving that apart, and then *perforating* into the *Wood*, to the thickness of the *bark* or more; with a like separation of what *distills*. The period also of its *current* would be calculated; as how much proceeds from the *bark* in one *hour*, how much from the *Wood* or *Body* of the *Tree*, and thus every *hour*, still a deeper incision, with a good large *Angre*, till the *Tree* be quite perforated: Then by making a *second hole* within the *first*, fitted with a lesser pipe, the interior *heart-sap* may be drawn apart, and examin'd by *Weight*, *Quantity*, *Colour*, *Distillation*, &c. And if no difference perceptible be detected, the presumption will be greater, that the difference of *heart* and *sap* in *Timber*, is not from the *Saps* plenty or penury, but the *season*; and then possibly, the very *season* of *squaring*, as well as *Felling* of *Timber*, may be considerable to the preservation of it.

6. The notice likewise of the *Saps* rising more plentifully, and constantly in the *Sun*, than *shade*; more in the *Day* than *Night*, more in the *Roots* than *Branch*, more *Southward*, and when *that*, and the *West Wind* blows, than *Northward*, &c. may yield many useful *Observations*: As for *planting*, to set thicker, or thinner (*scilicet cetera sint paria*) namely, the nature of the *Tree*, *soyl*, &c.) and not to shade overmuch the *Roots* of those *Trees* whose *stems* we desire should mount, &c. That in *transplanting* *Trees* we turn the best, and largest *Roots* towards the *South*, and consequently the most ample, and spreading part of the *head* correspondent to the *Roots*: For if there be a strong *Root* on that *Quarter*, and but a feeble attraction in the *Branches*, this may not always counterpoise the weak *Roots* on the *North-side*, dammified by the too puissant attraction of over large *Branches*: this may also suggest a cause why *Trees* flourish more on the *South-side*, and have their *Integument*, and *Coates* thicker on those aspects *annually*, with divers other useful *speculations*, if in the mean time, they seem not rather to be *puntillor*, over nice for a plain *Forester*. Let the *Curious* further consult *Philos. Transactions* Numb. 43, 44, 46, 48, 57, 58, 68, 70, 71. for farther *Instances* and *Trials*, upon this subject of *Sap*.

7. To shew our *Reader* yet, that there are no novel *Experiments*, we are to know, that a large *Tract* of the *World*, almost altogether subsists on these *Treen Liquors*; Especially, that of the *Date*, which being grown to about seven, or eight foot in height, they wound, as we have taught, for the *Sap*, which they call *Toddy*, a very famous *Drink* in the *East-Indies*. This *Tree* increasing every year about a foot, near the opposite part of the first *Incisure*, they pierce again, changing the *Receiter*; and so still by opposite wounds, and *Notches*, they yearly draw forth the *Liquor*, till it arrive to near *thirty* foot upward, and of these they have ample *Groves*, and *Plantations* which they set at seven, or eight foot distance:

stance: But then they use to *percolate* what they extract, through a *Stratum* made of the *Rind* of the *Tree*, well contus'd and beaten, before which preparation, it is not safe to Drink it; and 'tis observed that some *Trees* afford a much more generous *Wine*, than others of the same kind. In the *Coco*, and *Palmeto* Trees, they Chop a Bough as we do the *Betula*; but in the *Date*, make the *Incision* with a *Chisel* in the Body very neatly, in which they stick a *Leaf* of the *Tree*, as a *lingula* to direct it into the appendent *Vessel*, which the subjoyn'd *Figure* represents, and illustrates with its improvement to our former Discourse.

Note, *If there be no sitting Arms, the hole thus obliquely perforated, and a Faucet or pipe made of a Swans, or Gooles quill inserted, will lead the Sap into the Recipient; and this is a very neat way, and as effectual.*



(a. b.) the body of the Tree (g.) board at that part of the Arm (f.) joyn'd to the Stem, with an Augre of an inch or more diameter, according to the bigness of the Tree. (c.) a part of the Bark, or if you will, a Faucet of quill bent down into the mouth of the Bottle (e) to conduct the Liquor into it. (d.) the String about the Arm (f) by which the Bottle hangs.

8. The

8. The *Liquor* of the *Birch* is esteem'd to have all the *Virtues* of the *Spirit of Salt*, without the danger of its *acrimony*; most powerful for the dissolving of the *Stone* in the *Bladder*: *Helmont* ^{Dr. Libani, c. 8. n. 24, 25.} shews how to make a *Beer* of the *Water*; but the *Wine* is a most *rich Cordial*, curing (as I am told) *Consumptions*, and such interior *Diseases* as accompany the *Stone* in the *Bladder* or *Reins*: The juice decocted with *hony* and *wine*, *Dr. Needham* affirms he has often cur'd the *Scorbut* with. This *Wine*, exquisitely made, is so strong, that the common sort of *stone-bottles* cannot preserve the *spirits*, so subtle they are and *volatile*; and yet it is gentle, and very harmless in operation within the *body*, and exceedingly sharpens the *Appetite*, being drunk *ante pastum*: I will present you a *Receipt*, as it was sent me by a fair *Lady*.

9. To every *Gallon* of *Birch-water* put a quart of *Hony*, well stirr'd together; then boyl it almost an hour with a few *Cloves*, and a little *Limon-peel*, keeping it well scumm'd: When it is sufficiently boild, and become cold, add to it three, or four spoonfulls of good *Ale* to make it work (which it will do like new *Ale*) and when the *Yeast* begins to settle, *bottle* it up as you do other *winy* *Liquors*. It will in a competent time, become a most brisk, and spiritous *Drink*, which (besides the former virtues) is a very powerful *opener*, and doing wonders for cure of the *Phtisick*: This *Wine* may (if you please) be made as successfully with *Sugar*, in stead of *Hony*, 1*lb.* to each *Gallon* of *Water*; or you may dulcify it with *Raisins*, and compose a *Raisin-wine* of it. I know not whether the quantity of the sweet *Ingredients* might not be somewhat reduc'd, and the operation improv'd: But I give it as receiv'd. The Author of the *Vineta Brit.* boils it but to a *quarter* or *half* an hour, then setting it a cooling, adds a very little *Yeast* to ferment and purge it: and, so *barrels* it with a small proportion of *Cinamon*, and *Mace* bruis'd, about half an *ounce* of both to ten *Gallons*, close stop'd, and to be *bottled* a month after. Care must be taken to set the *Bottles* in a very cool place, to preserve them from *flying*; and the *Wine* is rather for *present* drinking, than of long duration, unless the *Refrigeratorie* be extraordinarily cold.

10. But besides these, *Beech*, *Alder*, *Ash*, *Elder*, &c. would be attempted for *Liquors*: Thus *Crabs*, and even our very *Brambles*, may possibly yield us *medical*, and useful *Wines*. The *Poplar* was heretofore esteem'd more *Physical* than the *Betula*. The *Sap* of the *Oak*, juice, or decoction of the inner bark, cures the *Fashions*, or *Farcy*, a virulent and dangerous infirmity in *Horses*, and which (like *Cancers*) were reputed incurable by any other *Topic*, than some actual, or potential *cautery*: But, what is more noble; a dear Friend of mine assur'd me, that a Country Neighbour of his (at least *four score* years of age) who had lain sick of a bloody *Strangury* (which by cruel torments reduc'd him to the very article of Death) was, under *God*, recover'd to perfect, and almost miraculous health, and strength (so as to be able to fall stoutly to his labour) by one sole Draught of *Beer*, wherein was the decoction

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of the internal bark of the *Oak tree*; And I have seen a *Composition* of an admirable *sudorific*, and *diuretic* for all affections of the *Liver*, out of the like of the *Elm*, which might yet be drunk daily as our *Cophee* is, and with no less delight; but *Quacking* is not my *Trade*: I speak only here as a plain *Husband-man*, and a simple *Forester*, out of the limits whereof, I hope I have not unpardonably transgress'd: *Pan* was a *Physician*, and *he* (you know) was *President of the Woods*. But I proceed.

C H A P. XVII.

Of the *Hasel*.

Hasel.

1. *N*ux *Sylvestris*, or *Corylus*, the *Hasel*, is best rais'd from the *Nuts*, (also by *Suckers* and *Layers*) which you shall sow like *Mast*, in a pretty deep *furrow* toward the end of *February*, or treat them as you are instructed in the *Wal-nut*; Light ground may immediately be sown and *barrow'd* in very accurately; but in case the mould be *clay*, plow it earlier, and let it be sufficiently mellow'd with the *Frosts*; and then the third year, cut your *Trees* near to the ground with a sharp *bill*, the *Moon* decreasing.

2. But if you would make a *Grove* for Pleasure, *Plant* them in *Fosses*, at a yard distance, and cut them within half a foot of the earth, dressing them for three, or four *Spring*s and *Autumn*s, by only loosning the *Mould* a little about their roots. Others there are, who set the *Nuts* by hand at one foot distance, to be *transplanted* the third year at a yard asunder: But this work is not to be taken in hand so soon as the *Nuts* fall, till *Winter* be well advanced; because they are exceedingly obnoxious to the *Frosts*; nor will they sprout till the *Spring*; besides, *Vermine* are great devourers of them: Preserve them therefore moist, not mouldy; by laying them in their own *dry leaves*, or in *Sand*, till *January*.

Hasels from *Sees* and *Suckers* take.

Plantis & dura Coryli nascentur ————
Georg. 2.

3. From whence they thrive very well, the *shoots* being of the scantlings of small *wands*, and *switches*, or somewhat bigger, and such as have drawn divers *hairy* twigs, which are by no means to be disbranch'd, no more than their *Roots*, unless by a very sparing and discreet hand. Thus, your *Coryletum*, or *Copp'ce* of *Hasels* being *Planted* about *Autumn*, may (as some practise it) be cut within three, or four inches of the ground the *Spring* following, which the new *Cyon* will suddenly repair, in clusters, and tufts of fair *poles* of twenty, and sometimes thirty foot long: But I rather should spare them till two, or three years after, when they shall have

have taken strong hold, and may be cut close to the very Earth; the improsperous, and feeble ones especially. Thus are likewise *Filberts* to be treated, both of them improv'd much by *transplanting*, but chiefly by *Grafting*, and it would betry'd with *Filberts*, and even with *Almonds* themselves, for more elegant Experiments.

4. For the *Place*, they above all affect *cold*, *barren*, *dry*, and *Sandy* grounds; also *Mountains*, and even *Rockie* Soils produce them; but more plentifully, if somewhat moist, dankish, and mossie, as in the fresher *bottoms*, and sides of *Hills*, *Hoults*, and in *Hedge-rows*. Such as are maintain'd for *Copp'ces*, may after Twelve years be fill'd the first time; the next, at seven or eight, &c. for by this period, their *Roots* will be compleatly vigorous. You may *Plant* them from *October* to *January*, provided you keep them carefully *Weeded*, till they have taken fast hold; and there is not among all our store, a more profitable wood for *Copp'ces*, and therefore good *Husbands* should store them with it.

5. The use of the *Hasel* is for *Poles*, *Spars*, *Hoops*, *Forks*, *Angling-rods*, *Faggots*, *Cudgels*, *Coals*, and *Springes* to catch birds; and it makes one of the best *Coals*, once us'd for *Gun-powder*, being very fine and Light, till they found *Alder* to be more fit: There is no Wood which purifies *Wine* sooner, than the *Chips* of *Hasel*: Also for *With's* and *Bands*, upon which, I remember *Pliny* thinks it a pretty *speculation*, that a Wood should be stronger to bind withal, being *bruise'd* and *divided*, than when *whole* and *entire*; The *Coals* are us'd by *Painters*, to draw with like those of *Sallow*: lastly, for *Riding Switches*, and *Divinatory Rods* for the detecting, and finding-out of *Minerals*; at least, if that *Tradition* be no imposture. But the most signal Honour it was ever employ'd in, and which might deservedly exalt this humble, and common *Plant* above all the *Trees* of the *Wood*, is that of *Hurdles*; not for that it is generally us'd for the Folding of our Innocent *Sheep*, an Emblem of the *Church*; but for making the *Walls* of one of the first *Christian Oratories* in the World; and particularly in this *Island*, that venerable, and Sacred *Fabrick* at *Glastenbury*, founded by S. *Joseph* of *Arimathea*, which is storied to have been first compos'd but of a few small *Hasel-Rods* interwoven about certain *stakes* driven into the ground; and *Walls* of this kind, in stead of *Laths* and *Punchions*, superinduc'd with a course *Mortar* made of *loam* and *straw*, does to this day, inclose divers humble *Cottages*, *Sheds* and *Out-houses* in the Countrey; and 'tis strong, and lasting for such purposes, *whole*, or *cleft*, and I have seen ample enclosures of *Courts*, and *Gardens* so secur'd.

6. There is a compendious expedient for the thickning of *Copp'ces* which are too *transparent*, by laying of a *Sampler* or *Pole* of an *Hasel*, *Asp*, *Poplar*, &c. of twenty, or thirty foot in length (the head a little lopp'd) into the ground, giving it a *Chop* near the foot, to make it succumb; this fastned to the earth with a *hook* or two, and cover'd with some fresh *mould* at a competent depth (as *Gardeners* lay their *Carnations*) will produce a world

of

of *Suckers*, thicken, and furnish a *Copp'ce* speedily. But I am now come to the *Water-side*; let us next consider the *Aquatic*.

C H A P. XVIII.

Of the Poplar, Aspen, and Abele.

Poplar.

1. *Populus*. I begin this second *Class* (according to our former *distribution*) with the *Poplar*, of which there are several kinds; *White, Black, &c.* (which in *Candy* 'tis reported bears seed) besides the *Aspen*. The *white* (famous heretofore for yielding its *Umbra* *hospitale*) is the most ordinary with us, to be rais'd in abundance by every *set* or *slip*. Fence the ground as far as any old *Poplar* roots extend, they will furnish you with *suckers* innumerable, to be shipp'd from their *mothers*, and *transplanted* the very first year: But if you cut down an old Tree, you shall need no other *Nursery*. When they are young, their *leaves* are somewhat broader and rounder (as most other *Trees* are) than when they grow aged. In moist, and *boggie* places they will flourish wonderfully, so the ground be not *spewing*; but especially near the *margins* and banks of *Rivers*,

Populus in fluvio —

and in low, sweet, and fertile grounds, yea and in the dryer likewise. Also *trunchions* of seven, or eight foot long, thrust two foot into the *earth*, (a hole being made with a sharp hard *stake*, fill'd with *water*, and then with fine *earth* pressed in, and close about them) when once *rooted*, may be cut at six inches above ground; and thus placed at a yard distant, they will immediately furnish a kind of *Copp'ce*. But in case you plant them of *rooted trees*, or smaller *sets*, fix them not so deep; for though we bury the *trunchions* thus profound, yet is the *root* which they strike commonly but shallow. They will make prodigious *shoots* in 15, or 16 years; but then the *heads* must by no means be diminish'd, but the lower branches may, yet not too far up; the *foot* would also be cleaned every second year. This for the *White*. The *Black Poplar* is frequently *pollard* when as big as ones arm, eight or nine foot from the ground, as they trim them in *Italy*, for their *Vines* to serpent on, and those they *poll*, or *head* every second year, sparing the middle, straight, and thrivingest *shoot*, and at the third year cut *him* also.

2. The *shade* of this tree is esteemed very wholesome in *summer*, but they do not become *Walks*, or *Avenues* by reason of their *suckers*, and that they foul the ground at fall of the leaf; but they would be planted in barren *Woods*, and to flank places at distance,

for

for their increase, and the glittering brightness of their foliage: The *leaves* are good for *cattel*, which must be stripp'd from the cut boughs before they are faggotted. This, to be done in the decrease of *October*, and reserv'd in bundles for winter *fodder*. The wood of white *Poplar* is sought of the *sculptor*, and they *saw* both sorts into *boards*, which, where they lie dry, continue a long time. Of this material they also made *shields* of defence in *Sword and Buckler* days. *Dioscorides* writes, that the *bark* chopt small, and sow'd in rills, well, and richly manur'd and watered, will produce a plentiful crop of *Mushrooms*; or warm *Water*, in which *Test* is dissolv'd, cast upon a new cut *stump*: It is to be noted, that those *Fungi*, which spring from the putrid stumps of this tree, are not *venenous* (as of all, or most other trees they are) being gathered after the first *Autumnal* rains. There is a *Poplar* of a paler green, and is the properest for watry ground: 'twill grow of *Trunchions* from two, to eight foot long, and bringing a good *top* in a short time, is by some prefer'd to *Willows*.

For the setting of these, Mr. *Cook* advises the *boring* of the ground with a sort of *Auger*, to prevent the stripping of the *bark* from the stake in planting: a foot and half deep, or more if great, (for some may be 8, or 9 foot) for *Pollards*, cut sloping, and free of cracks at either end: two or three inches *diameter* is a competent bigness, and the earth should be ram'd close to them.

Another expedient is, by making *drains* in very moist ground, two spade deep, and three foot wide, casting up the Earth between the *drains*, sowing it the first year with *Oats* to mellow the ground, the next winter setting it for *Copp'ce*, with these, any, or all the watry sorts of *Trees*; Thus, in four or five years, you will have a handsome *fell*, and so successively: It is in the former *Author*, where the charge is exactly calculated, to whom I refer the *Reader*.

3. They have a *Poplar* in *Virginia* of a very peculiar shap'd leaf, as if the point of it were cut off, which grows very well with the *curious* amongst us to a considerable stature. I conceive it was first brought over by *John Tradescant* under the name of the *Tulip-tree*, but is not that I find taken notice of in any of our *Herbals*; I wish we had more of them.

4. The *Aspen* only (which is that kind of *Lybia* or white *Poplar*, bearing a smaller, and more tremulous leaf) thrusts down a more searching foot, and in this likewise differs, that he takes it ill to have his head cut off: *Pliny* would have short *trunchions* couched two foot in the ground (but first two days dried) at one foot and half distance, and then moulded over.

5. There is something a finer sort of *white Poplar*, which the *Dutch* call *Abele*, and we have much transported out of *Holland*: these are also best propagated of *slips* from the *roots*, the leaf of which will *take*, and may in *March*, at three, or four years growth, be transplanted.

6. In *Flanders* (not in *France*, as a late *Author* pretends) they have large *Nurseries* of them, which first they plant at one foot distance,

stance, the mould light, and moist, by no means *clayie*, in which though they may shoot up tall, yet for want of root, they never spread; for, as I said, they must be *interr'd* pretty deep, not above three inches above ground; and kept clean, by *pruning* them to the middle *shoot* for the first two years, and so till the third, or fourth. When you *transplant*, place them at eight, ten, or twelve foot interval: They will likewise grow of *layers*, and even of *cuttings* in very moist places. In *three years*, they will come to an incredible altitude; in *twelve*, be as big as your middle; and in *eighteen or twenty*, arrive to full perfection. A specimen of this advance we have had of an *Abele* tree at *Sion*, which being lopp'd in *Febr.* 1651, did by the end of *October* 52 produce branches as big as a mans *wrist*, and 17 foot in length; for which celerity we may recommend them to such late *builders*, as seat their houses in naked, and unsheltered places, and that would put a guise of *Antiquity* upon any new *Inclosure*; since by these, whilst a man is in a *voyage* of no long continuance, his *house* and *lands* may be so covered, as to be hardly known at his return. But as they thus increase in *bulk*, their *value* (as the *Italian Poplar* has taught us) advances likewise; which after the first seven years, is annually worth *twelve pence* more; So as the *Dutch* look upon a *plantation* of these trees, as an ample portion for a *daughter*, and none of the least effects of their good *Husbandry*; which truly may very well be allow'd, if that *calculation* hold, which the *Knight* has asserted, who began his *plantation* not long since about *Richmond*, that 30 pound being laid out in these *plants*, would render at the least *ten thousand pounds* in *eighteen years*; every tree affording thirty *plants*, and every of them thirty more, after each seven years improving *twelve pence* in growth, till they arrived to their *acme*.

7. The *Black Poplar* grows rarely with us; it is a stronger, and taller tree than the *White*, the *leaves* more dark, and not so ample. Divers stately ones of these, I remember about the banks of *Po* in *Italy*; which flourishing near the old *Eridanus* (so celebrated by the *Poets*) in which the temerarious *Phaeton* is said to have been precipitated, doubtless gave argument to that *fiction* of his sad Sisters *Metamorphosis*, and the *Amber* of their pretious *tears*. It was whilst I was passing down that River towards *Ferrara*, that I diverted my self with this story of the ingenious *Poet*. I am told there is a *Mountain-Poplar* much propagated in *Germany* about *Vienna*, and in *Bohemia*, of which some trees have yielded *Planks* of a yard in breadth; why do we procure none of them?

8. The best use of the *Poplar*, and *Abele* (which are all of them hospitable trees, for any thing thrives under their *shades*) is for *Walks*, and *Avenues* about Grounds which are situated low, and near the water, till coming to be very old, they are apt to grow *knarry*, and out of proportion. The *timber* is incomparable for all sorts of white wooden vessels, as *Trays*, *Bowls* and other *Turners* ware; and of especial use for the *Bellows-maker*, because it is almost of the nature of *Cork*, and for *Ship pumps*, though not very solid, yet very close: also for wooden *heels*, &c. *Vitruvius* l. 2. de

materia

materia cedenda, reckons it among the Building-timbers, *que maxime in edificis sunt idonea*. Likewise to make *Carts*, because it is exceeding light; for *Vine*, and *Hop-prop*, and divers *vimineous* works. The loppings in *January* are for the *fire*; and therefore such as have proper Grounds, may with ease, and in short time, store themselves for a considerable *family*, where *fuel* is dear: but the truth is, it burns untowardly, and rather moulders away, than maintains any solid heat. Of the *twigs* (with the leaves on) are made *Brooms*. The *Brya*, or *Catkins* attract the *Bees*, as do also the *leaves* (especially of the *black*) more tenacious of the *Mel-dews* than most *Forest-trees*, the *Oak* excepted.

Of the *Aspen*, our *Wood-men* make *Hoops*, *Fire-wood*, and *Coals*, &c.

The juice of *Poplar* leaves, drop'd into the *ears*, asswages the pain; and the *buds* contus'd, and mix'd with *Hony*, is a good *Collyrium* for the *eyes*: as the *Unguent*, to refrigerate and cause sleep.

C H A P. XIX.

Of the Alder.

1. *Alnus*, the Alder, is of all other the most faithful lover of *Alder*: *watery* and *boggie* places, and those most despis'd weeping parts, or *water-galls* of *Forests*; — *crassique paludibus Alni*. They are propagated of *Trunchions*, and will come of *seeds* (for so they raise them in *Flanders*, and make wonderful profit of the *plantations*) like the *Poplar*; or of *Roots*, which I prefer, being set as big as the small of ones leg, and in length about two foot; whereof one would be plunged in the *mud*. This profound fixing of *Aquatick-trees* being to preserve them *steddy*, and from the concussions of the *winds*, and violence of *waters*, in their *liquid*, and slippery foundations. They may be placed at four, or five foot distance, and when they have struck root, you may cut them, which will cause them to spring in *clumps*, and to shoot out into many useful *Poles*. But if you plant smaller *Sets*, cut them not till they are arriv'd to some competent bigness; and that in a proper *season*: which is, for all the *Aquatics* and soft woods, not till *Winter* be well advanc'd, in regard of their *pithy* substance. Therefore, such as you shall have occasion to make use of before that period, ought to be well-grown, and sell'd with the *earliest*, and in the first quarter of the increasing *Moon*; that so the successive *shoot* receive no prejudice. But there is yet another way of planting *Alders* after the *Jersey* manner, and as I receiv'd it from a most ingenious *Gentleman* of that Country, which is, by taking *trunchions* of two, or three foot long, at the beginning of *Winter*, and to bind them in *faggots*, and place the *ends* of them in *water* 'till to-

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wards

wards the *Spring*, by which season they will have contracted a swelling *Spire*, or *kurr* about that part, which being set, does (like the *Gennet-moil Apple*) never fail of growing and striking root. There is a *black* fort more affected to *Woods*, and drier grounds.

2. There are a sort of *Husbands* who take excessive pains in *subbing* up their *Alders*, where ever they meet them in the *boggie* places of their grounds, with the same indignation as one would extirpate the most pernicious of *Weeds*; and when they have finished, know not how to convert their best *lands* to more profit than this (seeming despicable) *plant* might lead them to, were it rightly understood. Besides, the *shadow* of this *tree*, does feed, and nourish the very *grass* which grows under it; and being set, and well plashed, is an excellent defence to the banks of *Rivers*; so as I wonder it is not more practis'd about the *Thames*, to fortifie, and prevent the mouldring of the *walls*, and the violent *weather* they are exposed to.

3. You may cut *Aquatic-trees* ever third or fourth year, and some more frequently, as I shall shew you hereafter. They should also be abated within half a foot of the principal *head*, to prevent the perishing of the main *stock*; and besides, to accelerate their sprouting. In setting the *Trunchions*, it were not amiss to prepare them a little after they are fitted to the size, by laying them a while in *water*; this is also practicable in *Willows*, &c.

4. Of old they made *Boats* of the greater parts of this Tree, and excepting *Noah's Ark*, the first *Vessels* we read of, were made of this *Wood*.

When hollow Alders float the Waters glad,

Tunc alnos primum fluvii senebre cavatas.

Georg. 1.

And down the rapid Pae light Alders glide.

Nec non & torrentum undam levis innatat alnus
diffusa Pado.

2.

And as *then*, so *now*, are over-grown *Alders* frequently sought after, for such *Buildings* as lye continually under *water*, where it will harden like a very *stone*; whereas being kept in any unconstant temper, it *Rots* immediately, because its natural *humidity* is of so near affinity with its adventitious, as *Scaliger* assigns the cause. *Vitruvius* tells us, that the *Morasses* about *Ravenna* in *Italy*, were pil'd with this *Timber*, to *superstruct* upon, and highly commends it. I find also they us'd it under that famous *Bridge* at *Venice*, the *Rialto*, which passes over the *Gran-Canal* bearing a vast weight.

5. The Poles of *Alder* are as useful as those of *Willows*; but the *Coals* far exceed them, especially for *Gun-powder*: The wood is likewise useful for *Piles*, *Pumps*, *Hop-poles*, *Water-pipes*, *Troughs*, *Sluces*, small *Traps*, and *Trenchers*, *Wooden-heels*; the bark is precious to *Dyers*, and some *Tanners*, and *Leather-dressers* make use of it; and with it, and the *Fruits* (instead of *Galls*) they compose an *Ink*. The fresh *Leaves* alone applied to the naked *soal* of the *Foot*, infinitely refresh the surbated *Traveller*. The bark macerated in *water*, with a little rust of *Iron*, makes a *black dye*, which may

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also be us'd for *Ink*: The interior rind of the *Black Alder* putges all *Hydronic*, and *Serous* humours; but it must be dry'd in the shade, and not us'd green, and the decoction suffer'd to settle two or three days, before it be drunk.

Being beaten with *Vinegar*, it heals the *Itch* certainly: As to other Uses the swelling *bunches*, which are now and then found in the old Trees, afford the *Inlayer* pieces curiously *chambletted*, and very hard, &c. but the *Fagots* better for the *Fire*, than for the *draining* of Grounds by placing them (as the guise is) in the *Trenches*; which old rubbish of *Flints*, *Stones*, and the like gross materials, does infinitely exceed, because it is for ever, preserves the *Drains* hollow, and being a little moulded over, will produce good *grass*, without any detriment to the ground; but this is a *secret*, not yet well understood, and would merit an express *Paragraph*, were it here seasonable.

— & jam nos inter opacas
Musa vocat Salices —

CHAP. XX.

Of the Withy, Sallow, Ozier, and Willow.

1. *Salix*, since *Cato* has attributed the third place to the *salix Withy*, *Jun*, preferring it even next to the very *Ortyard*; and (what one would wonder at) before even the *Olive*, *Meadow*, or *Corn-field* it self (for *Salidum tertio loco, nempe post vineam, &c.*) and that we find it so easily rais'd, of so great, and universal Use, I have thought good to be the more particular in my Discourse upon them; especially, since so much of that which I shall Publish concerning them, is deriv'd from the long Experience of a most Learned, and ingenious Person, from whom I acknowledge to have receiv'd many of these hints. Not to perplex the Reader with the various names, *Greek*, *Gallic*, *Sabinic*, *Amerine*, *Vitex*, &c. better distinguish'd by their growth, and bark; and by *Latine Authors* all comprehended under that of *Salices*; our *English Books* reckon them promiscuously thus; The *Common-white Willow*, the *Black*, and the *Hard-black*, the *Rose* of *Cambridge*, the *Black-Withy*, the *Round-long Sallow*; the longest *Sallow*, the *Crack-Willow*, the *round-Ear'd shining Willow*, the *Lesser broad-leav'd Willow*, *Silver Sallow*, *Upright broad-Willow*, *Repent broad-leav'd*, the *Red-stone*, the *Lesser Willow*, the *Strait-Dwarf*, the *yellow Dwarf*, the *long leav'd yellow Sallow*, the *Creeper*, the *Black-low Willow*, the *Willow-bay*, and the *Ozier*. I begin with the *Withy*.

2. The *Withy* is a reasonable large Tree, and fit to be planted

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on

on high Banks, and *ditch* sides within reach of water, and the weeping sides of *Hills*; because they extend their Roots deeper than either *Sallows* or *Willows*. For this reason you shall Plant them at ten, or twenty foot distance; and though they grow the slowest of all the *Twiggie* Trees, yet do they recompence it with the larger *crop*; the *wood* being tough, and the *Twigs* fit to bind strongly; the very *peelings* of the branches being useful to bind *Arbor*-poling, and in *Topiary* works, *Vine-yards*, *Espalier*-fruit, and the like. There are two principal sorts of these *Withies*, the *hoary*, and the *red-Withy*, which is the *Greek*; toughest, and fittest to bind, whilst the *Twigs* are flexible and tender.

Sallow.

3. *Sallows* grow much faster, if they are Planted within reach of water, or in a very *Moorish* ground, or flat plain; and where the Soil is (by reason of extraordinary moisture) unfit for *Arable*, or *Meadow*; for in these cases, it is an extraordinary improvement; In a word, where *Birch*, and *Alder* will thrive. Before you Plant them, it is found best to turn the ground with a *Spade*; especially, if you design them for a flat. We have three sorts of *Sallows* amongst us (which is one more than the *Ancients* challeng'd, who name only the *Black*, and *White* which was their *Nitellina*) the vulgar round leaf, which proves best in dryer Banks, and the *hopping-Sallows*, which require a moister Soil, growing with incredible celerity: And a third kind, of a different colour from the other two, having the twigs reddish, the Leaf not so long, and of a more dusky green; more brittle whilst it is growing in *wig*, and more tough when arriv'd to a competent size: All of them useful for the *Thatcher*.

4. Of these, the *hopping-Sallows* are in greatest esteem, being of a clearer *terse* grain, and requiring a more succulent Soil; best planted a foot deep, and a foot and half above ground (though some will allow but a foot) for then every branch will prove excellent for future *jettings*. After three years growth (being cropped the second, and third) the first years increase will be 'twixt eight, and twelve foot long generally; the third years growth, strong enough to make *Rakes*, and *Pike-staves*; and the fourth for Mr. *Blithe's* trenching *Plow*, and other like *Utensils* of the *Husband-man*.

5. If ye Plant them at full height (as some do, at four years growth, letting them five, or six foot length, to avoid the biting of *Cattel*) they will be less useful for straight *staves*, and for *jettings*, and make less speed in their growth; yet this also is a considerable improvement.

6. These would require to be Planted at least five foot distance, (some set them as much more) and in the *Quincunx* order: If they affect the *soil*, the *Leaf* will come large, half as broad as a Man's hand, and of a more vivid green, always larger the first year, than afterwards: Some Plant them sloping, and cross-wise like a *Hedge*, but this impedes their wonderful growth; and (though *Pliny* seems to commend it, teaching us how to *excorticate* some places of each *set*, for the sooner production of *shoots*) it is but a deceitful

deceitful *Fence*, neither fit to keep out *Swine*, nor *sheep*; and being set too near, inclining to one another, they soon destroy each other.

7. The worst *sallows* may be planted so near yet, as to be instead of *Stakes* in a *Hedge*, and then their *Tops* will supply their dwarfishness; and to prevent *Hedge-breakers*, many do thus Plant them; because they cannot easily be pull'd up, after once they have struck root.

8. If some be permitted to wear their *Tops* five, or six years, their *Palms* will be very ample, and yield the first, and most plentiful relief to *Bees*, even before our *Abricots* Blossom. The *hopping-Sallows* open, and yield their *Palms* before other *Sallows*, and when they are blown (which is about the exit of *May*, or sometimes *June*) the *Palms* (or *δένδρον*, *frugiperda* as *Homer* terms them for their extream levity) are four inches long, and full of a fine lanuginous *Cotton*: A poor Body might in an hours space, gather a pound or two of it, which resembling the finest *Silk*, might doubtless be converted to some profitable use, by an ingenious *House-wife*, if gather'd in calm *Evenings*, before the *Wind*, *Rain*, and *Dew* impair them; I am of opinion, if it were dri'd with care, it might be fit for *Cushions*, and *Pillows* of *Chastity*, for such of old was the reputation of those *Trees*.

9. Of these *hopping Sallows*, after three years Rooting, each Plant will yield about a score of *Staves*, of full eight foot in length, and so following, for use, as we noted above: Compute then how many fair *Pike-staves*, *Perches*, and other useful *Materials*, that will amount to in an *Acre*, if Planted at five foot interval: But a fat and moist Soil, requires indeed more space, than a lean or dryer; namely *six*, or *eight* foot distance.

10. You may Plant *setlings* of the very first years growth; but the second year they are better, and the third year, better than the second; and the fourth, as good as the third; especially, if they approach the *Water*. A bank at a foot distance from the *water*, is kinder for them than a *Bog*, or to be altogether immer'd in the *water*.

11. 'Tis good to new-mould them about the *Roots* every second, or third year; but *Men* seldom take the pains. It seems that *Sallows* are more hardy, than even *Willows* and *Oziers*, of which *Colonnella* takes as much care as of *Vines* themselves. But 'tis cheaper to supply the *vacuity* of such accidental decays, by a new *Plantation*, than to be at the charge of *digging* about them three times a year, as that *Author* advises; seeing some of them will decay, whatever care be used.

12. *Sallows* may also be propagated like *Vines*, by *coumbing*, and bowing them in *Arches*, and covering some of their parts with mould, &c. Also by *Cuttings*, and *Layers*, and some years by the seeds likewise.

13. For *Setlings*, those are to be prefer'd which grow nearest to the *Stock*, and so (consequently) those *moist*, which most approach the *Top*. They should be Planted in the first fair, and pleasant

pleasant Weather in *February*, before they begin to *bud*; we about *London* begin at the latter end of *December*. They may be cut in *Spring* for *Fuel*, but best in *Autumn* for *use*; but in this work (as of *Poplar*) leave a *twig* or two; which being twist-ed *Arch-wise*, will produce plentiful *sprouts*, and suddenly furnish a *head*.

14. If in our *Coppices* one in four were a *Sallow* set, amongst the rest of varieties, the profit would recompence the care; therefore where in *woods* you grub up Trees, thrust in *Trunchions* of *Sallows*, or some *Aquatic* kind.

15. The swift growing *Sallow* is not so tough, and hardy for some *uses* as the *flower*, which makes *Stocks* for *Gard'ners Spades*; but the other are proper for *Rakes, Pikes, Mops, &c.* *Sallow-Coal* is the soonest consum'd; but of all others, the most easie and accommodate for *Painters Scribets* to design their *Work*, and first draught on *Paper* with *&c.* as being fine, and apt to slit into *Pen-cils*.

16. To conclude, there is a way of *Grafting* a *sallow* trunchion; take it of two foot and half long, as big as your *wrist*; Graft at both ends a *Figure*, and *Mulberry* Cyon of a foot long, and so, without *claying*, set the *Stock* so far into the ground, as the *Plant* may be three, or four inches above the Earth: This (some affirm) will thrive exceedingly the *first* year, and in *three*, be fit to *trans-plant*. The season for this Curiosity is *February*. Of the *Sallow* is made the *Shoo-makers* carving or *Cutting-board*, as best to preserve the edge of their *knives*, for its equal softness every way.

17. *Oziers*, or the *Aquatic Salix*, are of innumerable kinds, commonly distinguish'd from *Sallows*, as *Sallows* are from *Withies*; being so much smaller than the *Sallows*, and shorter liv'd, and requiring more constant *moisture*, yet would be Planted in rather a *dryish* ground, than over *moist* and spewing, which we frequently cut Trenches to avert: It likewise yields more limber, and flexible *twigs* for *Baskets, Flasks, Hampers, Cages, Lattices, Cradles*, the Bodies of *Coaches*, and *Wagons*, for which 'tis of excellent use, light, durable, and neat, as it may be wrought and cover'd: For *Chairs, Hurdles, Stays, Bands, &c.* likewise for *Fish Wairs*, and to support the *Banks* of impetuous *Rivers*: In fine, for all *Wicker*, and *Twiggie* works:

Viminibus Salices——

18. But these sort of *Oziers* would be cut in the new *shoot*; for if they stand longer, they become more inflexible; cut them close to the *head* (a foot, or so above earth) about the beginning of *October*; unless you will attend till the *Cold* be past, which is better; and yet we about *London*, cut them in the most piercing seasons, and Plant them also till *Candlemas*, which those who do not observe, we judge ill *Husbands*, as I learn from a very *Experienc'd Basket-maker*; and in the *decrease*, for the benefit of the *Work-man*, though not altogether for that of the *Stock*, and succeeding

ing *shoot*: When they are cut, make them up into *bundles*, and give them shelter; but such as are for *White-work* (as they call it) being thus *sagotted*, and made up in *Bolts*, as the term is, severing each sort by themselves, should be set in *water*, the ends dipped; but for *black*, and *unpeel'd*, preserv'd under *Covert* only, or in some *Vault* or *Cellar*, to keep them *fresh*, sprinkling them now and then in excessive hot Weather: The *peelings* of the former, are for the use of the *Gard'ner* and *Cooper*, or rather the *splittings*.

19. We have in *England* these three *vulgar* sorts; one of little worth, being brittle, and very much resembling the fore-mention'd *Sallow*, with reddish *twigs*, and more greenish, and rounder *Leaves*: Another kind there is, call'd *Perch*, of limber, and green *twigs*, having a very slender leaf; the *third* sort is totally like the *second*, only the *twigs* are not altogether so green, but *yellowish*, and near the *Popinjay*: This is the very best for *Use*, tough, and hardy. But the most usual names by which *Basket-makers* call them about *London*, and which are all of different *species* (therefore to be Planted separately) are, the *hard-Gelster*, the *Horfe-Gelster*, *Whyning*, or *shrivell'd-Gelster*, the *Black-Gelster*, in which *Suffolk* abounds. Then follow the *Golfstone*, the *hard*, and the *soft Golfstone* (brittle, and worst of all the *Golfstones*) the sharp, and slender top'd *yellow-Golfstone*; the fine *Golfstone*: Then is there the *yellow Ozier*, the *green Ozier*, the *Snake*, or *speckled Ozier*, *Swallow-tail*, and the *Spaniard*: To these we may add (amongst the number of *Oziers*, for they are both govern'd and us'd alike) the *Flanders Willow*, which will arrive to be a large *Tree*, as big as ones middle, the oftner cut, the better: With these our *Coopers* tie their *Hoops*, to keep them bent. Lastly, the *white-Sallow*, which being of a Year or two growth, is us'd for *Green-work*; and if of the toughest sort, to make *quarter-Can-hoops*, of which our *Seamen* provide great quantities, &c.

20. These choicer sorts of *Oziers*, which are ever the *smallest*, also the *golden-yellow*, and *white*, which is prefer'd for propagation, and to breed of, should be Planted of *slips* of two, or three years growth, a foot deep, and half a yard length, in *Moorish* ground, or *banks*, or else in *furrows*; so that (as some direct) the *Roots* may frequently reach the *water*; for *Fulminibus Salices*—though we commonly find it *rots* them, and therefore never choos'd to set them so deep as to scent it, and at three, or four foot distance.

21. The Season for Planting is *January*, and all *February*, though some not till mid-*February*, at two foot square; but *Cattel* being excessively liquorish of their *leaves* and tender *buds*, some talk of a *grafting* them out of reach upon *sallows*, and by this, to advance their sprouting; but as the *work* would consume time, so have I never seen it succeed.

22. Some do also Plant *Oziers* in their *Eights*, like *Quick-sets*, thick, and (near the water) keep them not more than half a foot above ground; but then they must be diligently cleans'd from *Moss*, *Slab*, and *Onze*, and frequently *prun'd* (especially the smaller spires)

to form single shoots; at least, that few, or none grow double: These, they head every second year about *September*, the *Autumnal* cuttings being best for use: But generally

23. You may cut *Withies*, *Sallows*, and *Willows*, at any mild, and gentle season between leaf and leaf, even in *Winter*; but the most congruous time both to *Plant*, and to *cut* them, is *Crescente Luna Vere, circa calendas Martias*; that is, about the new Moon, and first open weather of the early Spring.

24. It is in *France*, upon the *Loire*, where these *Eights* (as we term them) and Plantations of *Oziers*, and *Withies* are perfectly understood; and both there, and in divers other Countries beyond Seas, they raise them of *Seeds*, contain'd in their *Inti*, or *Catkins*, which they sow in *Furrows*, or shallow *Trenches*, and it springs up like *Corn* in the *blade*, and comes to be so tender and delicate, that they frequently mow them with a *Scyth*: This we have attempted in *England* too, even in the place where I live, but the obstinate, and unmerciful *Weed* did so confound them, that it was impossible to keep them clean with any ordinary Industry, and so they were given over: It seems either *weeds* grow not so fast in other Countries, or that the *People* (which I rather think) are more patient and laborious. Note, that these *Inti*, are not all of them seed-bearers, some are *sterile*, and whatever you raise of them, will never come to bear; and therefore by some they are call'd the *Male* sort, as Mr. Ray (that learned Botanist) has observ'd. The *Ozier* is of that Emolument, that in some places I have heard twenty pounds has been given for one Acre; ten is in this part an usual price; and doubtless, it is far preferable to the best *Cornland*; not only for that it needs but once *Planting*, but because it yields a constant *Crop*, and revenue to the *Worlds* end; and is therefore in esteem of knowing Persons, valu'd in *Purchase* accordingly; consider'd likewise, how easily 'tis renew'd, when a Plant now and then fails, by but pricking in a *twig* of the next at hand, when you visit to cut them: We have in this *Parish* where I dwell, improv'd Land from less than one pound, to near ten pounds the Acre: And when we shall reflect upon the infinite quantities of them we yearly bring out of *France* and *Flanders*, to supply the extraordinary expence of *Basket-work*, &c. for the *Fruiters*, *Lime-burners*, *Gardeners*, *Coopers*, *Packers* up of all sorts of *Ware*, and for general *Carriage*, which seldom last above a Journey or two; I greatly admire *Gentlemen* do no more think of employing their moist grounds (especially, where *Tides* near fresh *Rivers* are reciprocal) in *Planting*, and propagating *Oziers*. To omit nothing of the Culture of this useful *Ozier*, *Pliny* would have the place to be prepar'd by *trenching* it a foot, and half deep, and in that, to fix the *sets*, or cuttings of the same length at six foot interval. These (if the *sets* be large) will come immediately to be *Trees*; which after the first three years, are to be abated within two foot of the ground. Then, in *April*, he advises to dig about them: Of these they formerly made *Vine-props*, and one Acre hath been known to yield *Props* sufficient, to serve a *Vineyard* of twenty five Acres.

25. John

25. John Tradescant brought a small *Ozier* from S. Omers in *Flanders*, which makes incomparable *Nest-work*, not much inferior to the *Indian* twig, or *bent-work*, which we have seen; but if we had them in greater abundance, we should haply want the *Artificers* who could employ them, and the dexterity to *Varnish* so neatly.

26. Our common *Salix* or *Willow*, is of two kinds, the *white* and *Willow*, the *black*: The *white* is also of two sorts, the one of a *yellowish*, the other of a *browner* Bark: The *black Willow* is Planted of *stakes*, of three years growth, taken from the head of an old Tree, before it begins to sprout: Set them of six foot high, and ten distant; as directed for the *Poplar*. Those *Woody* sorts of *Willow*, delight in *Meads*, and *Ditch-sides*, rather *dry*, than over *wet* (for so they last longest) yet the *black* sort, and the *reddish*, do sometimes well in more *boggie* grounds, and would be Planted of *stakes* as big as one's Leg, cut as the other, at the length of five, or six foot, or more into the earth; the *hole* made with an *Oken-stake* and beetle, or with an *Iron crow* (some use a long *Auger*) so as not to be forced in, with too great violence: But first, the *Truncations* should be a little stop'd at both extremes, and the biggest plant'd downwards: To this, if they are *soak'd* in *water* two or three days (after they have been siz'd for length, and the twigs cut off ere you plant them) it will be the better. Let this be done in *February*; the *mould* as well clos'd to them as possible, and treated as was taught in the *Poplar*. If you Plant for a kind of *Wood*, or *Coppice* (for such I have seen) set them at six foot distance, or nearer, in the *Zyucunx*, and be careful to take away all *suckers* from them at three years end: You may abate the head half a foot from the *Trunk*, viz. three, or four of the lustiest *shoots*, and the rest cut close, and bare them yearly, that the *three, four* or more you left, may enjoy all the *Sap*, and so those which were spared, will be gallant *Pearches* within two years. Arms of four years growth, will yield substantial *sets*, to be Planted at eight, or ten foot distance; and for the first three years well defended from the *Cattel*, who infinitely delight in their *leaves*, green, or wither'd. Thus, a *Willow* may continue *twenty*, or *five* and *twenty* years, with good profit to the industrious Planter, being headed every four, or five years; some have been known to shoot no less than *twelve* foot in one year, after which, the old, rotten *Dotards* may be *fell'd*, and easily suppli'd. But if you have ground fit for whole *Coppices* of this wood, cast it into double *Dikes*, making every *fosse* near three foot wide, two and half in depth; then leaving four foot at least of ground for the earth (because in such *Plantations* the moisture should be below the *Roots*, that they may rather see, than feel the *Water*) and two *Tables* of *sets* on each side, plant the *Ridges* of these *Banks* with but one single *Table*, longer, and bigger than the *Collateral*, viz. three, four, five or six foot high, and distant from each other, about two yards. These *banks* being carefully kept *weeded* for the first two years, till the *Plants* have vanquish'd the *Grass*, and not cut till the *third*; you may then lop them *verse*.

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verse,

verse, and not obliquely, at one foot from the ground, or somewhat more, and they will *head* to admiration: But such which are cut at three foot height, are most durable, as least soft and *aquatic*: They may also be *Grafted* twixt the *Bark*, or *budded*; and then they become so beautiful, as to be fit for some kind of delightful *Walks*; and this I wish were practis'd among such as are seated in low, and Marshy places, not so friendly to other *Trees*. Every *Acre* at eleven, or twelve years growth, may yield you near an *hundred Load of Wood*: Cut them in the *Spring* for dressing, but in the *Fall* for *Timber* and *Fuel*: I have been inform'd, that a *Gentleman* in *Essex*, has lopp'd no less than 2000 yearly, all of his own planting. It is far the sweetest of all our *English Fuel*, provided it be found and dry, and emitting little *Smoke*, is the fittest for *Ladies Chambers*; and all those *Woods*, and *Twigs* would be cut either to *Plant*, *Work* with, or *Burn* in the dryest time of the day.

27. There is a sort of *Willow* of a slender, and long Leaf, resembling the smaller *Ozier*; but rising to a Tree as big as the *sallow*, full of *knots*, and of a very brittle *spray*, only here *rehears'd* to acknowledge the *variety*.

28. There is likewise the *Garden-willow*, which produces a sweet, and beautiful *flower*, fit to be admitted into our *Hortulan* ornaments, and may be set for *partitions of Squares*; but they have no affinity with other. There is also in *Shropshire* another very *odoriferous* kind, extremely fit to be planted by pleasant *Rivulets*, both for ornament and profit: It is propagated by *cuttings* or *layers*, and will grow in any dry bottom, so it be sheltered from the *South*, affording a wonderful and early relief to the industrious *Bee*: *Vitruvius* commends the *Vitex* of the *Latines* (impertinently call'd *Agnus Castus*, the one being but the interpretation of the other) as fit for Building; I suppose they had a sort of better stature than the *Shrub* growing among the *curious* with us, and which is celebrated for its *chast* effects, and for which the *Antients* employ'd it in the *Rites of Ceres*: I rather think it more convenient for the *sculptor* (which he likewise mentions) provided we may (with safety) restore the *Text*, as *Perrault* has attempted, by substituting *Levitatem*, for the Authors *Rigiditatem*, *Stubborn materials* being not so fit for that curious Art.

29. What most of the former enumerated kinds differ from the *sallows*, is indeed not much considerable, they being generally useful for the same purposes; as *Boxes*, such as *Apothecaries*, and *Goldsmiths* use; for *Cart Saddle-trees*, yea *Gun-locks*, and *Half-Pikes*, *Harrows*, *Shoe-makers Lasts*, *Heels*, *Clogs* for *Pattens*, *Forks*, *Rakes*, especially the *Tooths*, which should be wedg'd with *Oak*, but let them not be cut for this when the *Sap* is stirring, because they will shrink, *Pearches*, *Hop-poles*, *Kicing* of *Kidney-beans*, and for *Supporters* to *Vines*, when our *English Vineyards* come more in request: Also for *Hurdles*, *Sieves*, *Lattices*; for the *Turner*, *Kyele-pins*, great *Town-Toppis*; for *Platters*, little *Casks* and *Vessels*; especially to preserve *Verjuices* in, the best of any:

Pales

Pales are also made of cleft *Willow*, *Dorsers*, *Fruit-baskets*, *Cannis*, *Hives* for *Bees*, *Trenchers*, *Trays*, and for polishing and whetting *Table-Knives*, the *Butler* will find it above any *Wood* or *Whet-stone*; also for *Coals* and *Bavin*, not forgetting the fresh *boughs*, which of all the *Trees* in nature, yield the most chaff, and coolest *shade* in the hottest season of the day; and this *Umbrage* so wholesome, that *Physicians* prescribe it to *Feaverish* persons, permitting them to be plac'd even about their *Beds*, as a safe, and comfortable *refrigerium*. The *wood* being preserv'd dry, will dure a very long time; but that which is found wholly *putrifi'd*, and reduc'd to a loamy earth in the hollow trunks of *superannuated* *Trees*, is, of all other, the fittest to be mingl'd with fine *mould*, for the raising our choicest *Flowers*, such as *Anemonies*, *Ranunculus*, *Auriculas*, and the like.

What would we more? low *Broom*, and *Sallows* wild,
Or feed the Flock, or Shepherds flinde, or Field
Hedges about, or do us Honey yield.

Quid majoresq' Salicet, humilisque gaudet,
Aut ille pecori frondem, aut pastoribus ambram
Sufficiunt, siveque Jatis, & pabula mellis.

Georg. 2.

30. Now by all these Plantations of the *Aquatic* *Trees*, it is evident, the *Lords* of *Moorish Commons*, and unprofitable *Wasts*, may learn some *Improvement*, and the neighbour *Bees* be gratified; and many *Tools* of *Husbandry* become much cheaper. I conclude, with the Learned *Stephanus*'s note upon these kind of *Trees*, after he has enumerated the universal benefit of the *Salicem*:
Nullius enim tutior redditus, minorisve impendii, aut tempestatis securior.

CHAP. XXI.

Of Fences, Quick-sets, &c.

OUR main *Plantation* is now finish'd, and our *Forest* a- *Fences*. dorn'd with a just *variety*: But what is yet all this labour, but loss of *time*, and irreparable *expence*, unless our *young*, and (as yet) tender *Plants* be sufficiently guarded from all external *injuries*? For, as old *Tusser*,

It Cattel, or Tony may enter to Crop,
Young Oak is in danger of losing his Top.

But with something a more polish'd *style*, though to the same purpose, the best of Poets,

Plash Fences thy Plantation round about,
And whilst yet Young, be surekeep Cattel out;
Severest Winters, scorching Sun inest, (left;
And Sheep, Goats, Bullocks, all young Plants mo-
Yet neither Cold, nor the heat rigid froth,
Nor Heat reflecting from the Rocky Coast,
Like Cattel Trees, and tender Shoots confound,
When with venom'd Teeth the twigs they

(wound.

Texunda spes etiam, & pecus omne tenendum est:
Præcipue, dum fœvis tenuis, ingrediturque laborum,
Cui, super indigenas homines, solomque potentem,
Sylvæque Dei afflatus, capereque fœvæ.
Illudant: Pæstantur Ovis, avidæque juvenile.
Frigora nec tantum cana concreta pruina,
Aut gravis incumbens populus æventibus æstas,
Quantum illi nocere grægis, durique venenum
Dantis, & admofo signata in stipe cicatrix.

Georg. 2.

2. For, the reason that so many complain of the improperous condition of their *Wood-lands*, and *Plantations* of this kind, proceeds from this neglect; though (*Sheep* excepted) there is no employment whatsoever incident to the *Farmer*, which requires less expence to gratifie their expectations: One diligent, and skilful *Man* will govern five hundred Acres: But if through any accident a *Beast* shall break into his *Masters* Field; or the wicked *Hunter* make a Gap for his *Dogs* and *Horses*, what a clamor is there made for the disturbance of a years *Crop* at most in a little *Corn*? Whiles abandoning his young *Woods* all this time, and perhaps many years, to the venomous bitings and treading of *Cattel*, and other like injuries (for want of due care) the detriment is many times irreparable; Young *Trees* once cropp'd, hardly ever recovering: It is the bane of all our most hopeful *Timber*.

3. But shall I provoke you by an instance? A *Kinsman* of mine has a *Wood* of more than 60 years standing; it was, before he purchas'd it, expos'd and abandon'd to the *Cattel* for divers years: some of the outward skirts were nothing save *shrubs* and miserable *sterolings*; yet still the place was dispos'd to grow *woody*; but by this neglect continually suppress'd. The industrious *Gentleman* has Fenced in some Acres of this, and cut all close to the ground; it is come in eight or nine years, to be better worth than the *Wood* of sixty; and will (in time) prove most incomparable *Timber*, whiles the other (part so many years advanc'd) shall never recover; and all this from no other cause, than preserving it fenc'd. Judge then by this, how our *Woods* come to be so decry'd: Are five hundred *sheep* worthy the care of a *shepherd*? and are not five thousand Oaks worth the fencing, and the inspection of a *Hayward*?

And shall men doubt to Plant, and careful be?

Et dubitant homines severi, atque impendere curam?

Georg. 2.

Let us therefore shut up what we have thus laboriously Planted, with some good *Quick-set hedge*; Which,

—All Countries bear, in every ground
As Denizen, or Emer-loper found
From Gardens and wild fields expell'd, yet there;
On the extreme stands up, and claims a there;
Nor *Mossy-dog*, nor *Pike-man* can be found
A better Fence to the enclosed Ground.
Such breed the rough and hardy *Cantons* rear,
And into all adjacent Lands prefer,
Though rugged *Charles*, and for the *Battel* fit;
Who Courts and Stutes with Complement or Wit

—Omne solus natale est, intrat nubi
Arctilo; illa quidem cultis excludunt agris
Plumæque, atque horticæ, sed circumspicit aragque
Atque omnes aditus servat salissimæ culos,
Utilior latrante Canis, armatoque Priapo,
Aperit frigoribus laxissimæ Helvetia tales
Educat, & peregræ terras emittit in omnes
Enormis dardæque viros, sed fortis bello
Pestores non illi cultos, non moribus alas,

Tq

To civilize, nor to instruct pretend;
But with stout faithful service to defend.
This Tyrants know full well, nor more confide
On Guards that serve less for Defence than Pride:
Their Persons safe they do not judge amiss,
And Realms committed to their Guard w/ Swiss.

Atque Urbes decorare valent, sed utraque fideli
Defendant opera; nec illi, gens cauta, Tyranni,
Disponunt specula magis, multatque fœva
Prestidia; his cœti vitam tætantur opesque, &c.

Coulci §. l. 2.

For so the ingenious *Poet* has metamorphos'd him, and I could not withstand him.

4. The *Hei-thorne*, (*Oxyacantha vulgaris*) and indeed the very best of common *hedges*, is either rais'd of *seeds* or *Plants*; but then it must not be with despair, because sometimes you do not see them peep the first year; for the *Haw*, and many other *Seeds*, being invested with a very hard *Integument*, will now and then suffer imprisonment two whole years under the earth; and our impatience at this, does often frustrate the resurrection of divers seeds of this nature; so as we frequently dig up, and disturb the beds where they have been sown, in despair, before they have gone their full time; which is also the reason of a very popular mistake in other *Seeds*: Especially, that of the *Holly*, concerning which there goes a tradition; that they will not sprout till they be pass'd through the *Maw* of a *Thrush*; whence the saying, *Turdus exiturus suum cacat* (alluding to the *Viscus* made thereof, not the *Mistletoe* of *Oak*) but this is an error, as I am able to testify on experience; they come up very well of the *Berries*, treated as I have shew'd in Chap. 26. and with patience; for (as I affirm'd) they will sleep sometimes two entire years in their *Graves*; as will also the seeds of *Tew*, *Sloes*, *Phillyrea angustifolia*, and sundry others, whose shells are very hard about the small kernels; but which is wonderfully facilitated, by being (as we directed) prepar'd in beds, and *Magazines* of *Earth*, or *Sand* for a competent time, and then committed to the ground before the fall in *March*, by which season they will be chitting, and speedily take Root: Others bury them deep in the ground all *Winter*, and sow them in *February*: And thus I have been told of a *Gentleman* who has considerably improv'd his *Revenue*, by sowing *Haws* only, and raising *Nurseries* of *Quick-set*, which he sells by the hundred far and near: This is a commendable industry; any neglected corners of ground will fit this *Plantation*.

5. But *Columella* has another expedient for the raising of our *spinetum*, by rubbing the now mature *Hips* and *Haws*, into the crevices of *Bass-ropes*, and then burying them in a *Trench*: Whether way you attempt it, they must (so soon as they peep, and as long as they require it) be sedulously cleans'd of the weeds; which, if in beds for transplantation, had need be at the least three, or four years; by which time even your seedlings will be of stature fit to remove; for I do by no means approve of the vulgar premature Planting of *Setts*, as is generally us'd throughout *England*; which is to take such only as are the very smallest, and so to crowd them into three or four files, which are both egregious mistakes.

6. Whereas it is found by constant experience, that *Plants* as big as ones *Thumb*, set in the posture, and at the distance which we

spake

spake of in the *Horn-beam*; that is, almost *perpendicular* (not altogether, because the *Rain* should not get in 'twixt the *Rind* and *wood*) and fingle, or at most, not exceeding a double *row*, do prosper infinitely, and much out-strip the denselt, and closest ranges of our trifling *Sets*, which make but weak *shoots*, and whose roots do but hinder each other, and for being couch'd in that *posture*, on the sides of *Banks*, and *Fences* (especially where the earth is not very tenacious) are *bared* of the *mould* which should entertain them, by that time the *Rains*, and *Storms* of one *Winter* have pass'd over them. In *Holland*, and *Flanders* (where they have the goodliest *Hedges* of this kind about the *Counterscarps* of their invincible *fortifications*, to the great security of their *Musketers* upon occasion) they Plant them according to my description, and raise *Fences* so speedily, and so impenetrable, that our *best* are not to enter into the comparison. Yet, that I may not be wanting to direct such as either affect the other way, or whose *Grounds* may require some *Bank of Earth*, as ordinarily the verges of *Coppices*, and other Inclosures do: You shall by *line*, cast up your *foss* of about three foot broad, and about the same depth, provided your mould hold it; beginning first to turn the *surf*, upon which, be careful to lay some of the best *Earth* to bed your *Quick* in, and there *lay*, or *set* the *Plants*; *two* in a foot space is sufficient; being diligent to procure such as are *fresh* gathered, *straight*, *smooth*, and well *rooted*; adding now and then, at equal spaces of twenty, or thirty foot, a young *Oakling* or *Elm-lucker*, *Ash* or the like, which will come in time (especially in plain Countries) to be ornamental *Standards*, and good *Timber*: If you will needs multiply your rows, a *foot* or somewhat less: Above that, upon more congested mould, plant another rank of *sets*, so as to point just in the middle of the *vacuities* of the *first*, which I conceive enough: This is but for the single *Foss*; but if you would fortify it to the purpose, do as much on the other side, of the same *depth*, *height*, and *planting*; and then last of all, cap the top in *Pyramis* with the worst, or bottom of the *Ditch*: Some, if the *mould* be good, plant a row or two on the Edge, or very *crest* of the *monnd*, which ought to be a little flattened: Here also many set their *dry-Hedge*, to defend, and shade their under-plantation, and I cannot reprove it: But great care is to be had in this *work*; that the main bank be well *footed*, and not made with too sudden a declivity, which is subject to fall in after *frosts* and *wet* weather; and this is good husbandry for *moist* grounds; but where the Land lies *high*, and is hot and *gravelly*, I prefer the lower fencing; which, though *even* with the *area* it self, may be protected with *stakes* and a *dry hedge*, the distance competent, and to very good purposes of educating more frequent *Timber* amongst the rows.

7. Your *Hedge* being yet *Young*, should be constantly *weeded* two or three years, especially before *Midsummer* (of *Brambles* especially, the great *Dock*, and *Thistle*, &c.) though some admit not of this work till after *Michaelmas*, for *Reasons* that I approve not: It has been the practice of *Herefordshire*, in the plantation of *Quick-*

set-

set-hedges, to plant a *Crab-Stock* at every twenty foot distance; and this they observe so *Religiously*, as if they had been under some rigorous *Statute* requiring it: But by this means, they were provided in a short time with all advantages for the *grafting* of *Fruit* amongst them, which does highly recompense their industry. Some cut their *Sets* at three years growth even to the very ground, and find that in a *year* or *two*, it will have shot, as much as in *seven*, had it been let alone.

8. When your *Hedge* is now of near six years stature, *plash* it about *February* or *October*; but this is the work of a very dextrous, and skilful *Husbandman*; and for which our honest Country-man Mr. *Markham* gives excellent directions; only I approve not so well of his *deep cutting*, if it be possible to bend it, having suffered in some thing of that kind: It is almost incredible to what perfection some have laid these *Hedges*, by the *rural* way of *plashing*, better than by *clipping*; yet may both be used for *ornament*, as where they are planted about our *Garden-fences*, and *fields* near the *Mansion*. In *Scotland*, by tying the young *shoots* with *bands* of *hay*, they make the *stems* grow so very close together, as that it encloseth *Rabbits* in *Warrens* instead of *pales*.

9. And now since I did mention it, and that most I find do greatly affect the vulgar way of *Quicking* (that this our *Discourse* be in nothing deficient) we will in brief give it you again after *Geo. Markham's* description, because it is the best, and most accurate. although much resembling our former *direction*, of which it seems but a *Repetition*, 'till he comes to the *plashing*. In a Ground which is more *dry* than *wet* (for *watry* places it abhors) plant your *Quick* thus: Let the first row of *Sets* be placed in a *trench* of about half a foot deep, *even* with the top of your *ditch*, in somewhat a sloping, or inclining posture: Then, having rais'd your *bank* near a foot upon them, plant another *row*, so as their tops may just peep out over the middle of the *spaces* of your *first* row: These cover'd again to the height or thickness of the other, place a third *rank* opposite to the *first*, and then finish your bank to its intended height. The distances of the *plants* would not be above one *foot*; and the *season* to do the work in, may be from the entry of *February*, till the end of *March*; or else in *September*, to the beginning of *December*. When this is finish'd, you must guard both the top of your *Bank*, and outmost verge of your *Ditch*, with a sufficient *dry-hedge*, interwoven from *stake* to *stake* into the earth (which commonly they do on the bank) to secure your *Quick* from the spoil of *Cattle*. And then being careful to repair such as decay, or do not spring, by supplying the dead, and trimming the rest; you shall after three years growth, sprinkle some *Timber-trees* amongst them; such as *Oak*, *Beech*, *Ash*, *Maple*, *Fruit*, or the like; which being drawn young out of your *Nurseries*, may be very easily inserted. But that which we affirm'd to require the greatest dexterity in this work, is, the artificial *plashing* of our *Hedge*, when it is now arriv'd to a *six*, or *seven* years head; though some stay till the *tenth*, or longer. In *February* therefore, or *October*, with a very sharp *hand-bill*,

bill, cut away all superfluous *sprays* and *straglers*, which may hinder your progress, and are useless. Then, searching out the principal *stems*, with a keen, and light *Hatchet*, cut them *slant-wise* close to the *Ground*, about three quarters through, or rather, so far only, as till you can make them comply handomely, which is your best direction; and so lay it from your *sloping* as you go, folding in the lesser *branches* which spring from them; and ever within a five, or six foot distance, where you find an upright *set* (cutting off only the top to the height of your intended *hedge*) let it stand as a *stake*, to fortify your work, and to receive the *twinings* of those branches about it. Lastly, at the *top* (which would be about *five foot* above ground) take the longest, most slender, and flexible *twigs*, which you reserved (and being cut as the former, where need requires) bind in the extremities of all the rest, and thus your work is finish'd: This being done very close, and thick, makes an impregnable *Hedge*, in few years; for it may be repeated as you see occasion; and what you so cut away, will help to make your *dry-hedges* for your young *Plantations*, or be profitable for the *Oven*, and make good *Bavin*. For *stakes* in this work, *Oak* is to be prefer'd, though some will use *Elder*, but it is not good, or the *Black-Thorn*, *Crab-tree*, in moorish ground *Withy*, *Ash*, *Maple*, *Hazel*, but not lasting, driven well in at every *yard* of interval both before, and after they are bound, till they have taken the hard Earth, and are very fast; and even your *plash'd-hedges* need some small *thorns* to be lay'd over, to protect the *spring* from *Cattel* and *Sheep*, till they are somewhat fortified; and the doubler the *winding* is lodg'd, the better; which should be beaten, and forced down together with the *stakes*, as equally as may be. Note, that in sloping your *Windings*, if it be too low done (as very usually) it frequently mortifies the tops; therefore, it ought to be so bent, as it may not impede the mounting of the *sap*: If the *plash* be of a great, and extraordinary *age*, wind it at the neather boughs all together, and cutting the *sets* as directed, permit it rather to hang downwards a little, than rise too forwards; and then twist the branches into the work, leaving a *set* free, and unconstrain'd at every *yard* space, besides such as will serve for *stakes*, abated to about five-foot length (which is a competent stature for an *Hedge*) and so let it stand. One shall often find in this work, especially in *Old* neglected *Hedges*, some great *Trees*, or *stubs*, that commonly make *gaps* for *Cattel*: Such should be cut so near the Earth, as till you can lay them thwart, that the *top* of one, may rest on the *root*, or *stub* of the other, as far as they extend, stopping the *cavities* with its boughs and branches; and thus *Hedges* which seem to consist but only of *Scrubby-Trees* and *stumps*, may be reduc'd to a tolerable *Fence*. We have been the longer on these *descriptions*, because it is of main importance, and that so few *Husband-men* are perfectly skill'd in it: But he that would be more fully satisfied I would have to consult Mr. *Cook*, Chap. 32.

10. The *Root* of an *Old Thorn* is excellent both for *Boxer*, and *Combs*, and is curiously, and naturally wrought: I have read, that

that they made *ribs* to some small *Boats* or *Vessels* with the *White-Thorn*, and it is certain, that if they would plant them *single*, and in *standards*, where they might be safe, they would rise into large body'd *Trees* in time, and be of excellent use for the *Turner*, not inferior to *Box*.

The distill'd *water*, and *Stone*, or *kernels* of the *Haw* reduc'd to *powder*, is generally agreed to be *sovereign* against the *Stone*. The *Black-Crab* rightly season'd, and treated, is famous for *Walking-snares*, and if over-grown, us'd in *Mill-work* yea and for *Rafters* of great *ships*. Here we owe due *Elogy* to the Industry of my Lord *Shaftsbury*, who has taught us to make such Enclosures of *Crab-Stocks* only, (planted close to one another) as there is nothing more impregnable and becoming; or you may sow *Cider-kernels* in a *rill*, and fence it for a while, with a double *dry Hedge*, not only for a suddain, and beautiful, but a very profitable *Inclosure*; because, amongst other benefits, they will yield you *Cider-fruit* in abundance: But in *Devonshire*, they build two *walls* with their *stones*, setting them edgeways, two, and then one between; and so as it rises, fill the interval, or *cofer* with Earth (the *breadth* and *height* as you please) and continuing the *stone-work*, and *filling*, and as you work beating in the *stones* flat to the sides, they are made stick everlastingly: This is absolutely the neatest, most saving, and profitable *Fencing* imaginable, where *slaty stones* are in any abundance; and it becomes not only the most secure to the *Land*, but the best for *Cattel*, to lye warm under the *Walls*; whilst other *Hedges*, (be they never so thick) admit of some cold *winds* in Winter time when the leaves are off. Upon these *Banks* they plant not only *Quick-sets*, but even *Timber-trees*, which exceedingly thrive, being out of all danger.

11. The *Pyracanth*, *Palinurus*, and like pretiouser sorts of *Thorne*, might easily be propagated by *Seeds*, *layers* or *cutting*, into plenty sufficient to store even these vulgar *Uses*, were *Men* industrious; and then, how beautiful, and sweet would the *environs* of our *Fields* be? for there are none of the *spinous shrubs* more hardy, nor fitter for our defence. Thus might *Berberies* now and then be also inserted among our *hedges*, which, with the *Hips*, *Haws*, and *Cornel-berrier*, do well in *light lands*, and would rather be planted to the *South*, than *North* or *West*, as usually we observe them.

13. Some (as we noted) mingle their very *hedges* with *Oak-lings*, *Ash*, and *Fruit trees* sown, or planted, and 'tis a laudable improvement; though others do rather recommend to us *Sets* of all one sort, and will not so much as admit of the *Black-Thorne* to be mingled with the *White*, because of their unequal progress; and indeed, *Timber-trees* set in the *Hedge* (though *contemporaries* with it) do frequently wear it out; and therefore I should rather incurage such *Plantations*, to be at some *Tards* near the *Verge*, than *perpendicularly* in them. Lastly if in planting any the most robust *Forest-Trees*, (especially *Oak*, *Elms*, *Chestnut*) at competent spaces, and in *rows*; you open a *Ring* of ground, at about
four

four foot distance from the *stem*, and prick-in *quick-set* plants; you may after a while, keep them *clip'd*, at what height you please; They will appear exceedingly beautiful to the Eye, prove a good fence, and yield useful *buff*, *bavin*, and (if you maintain them unthorn) *Hips*, and *Haws* in abundance: This would therefore especially be practis'd, where one would invite the *Birds*.

14. In *Cornwal* they secure their *Lands* and *Woods*, with high *Mounds*, and on them they plant *Acorns*, whose roots bind in the looser mould, and so form a double, and most durable *Fence*, incircling the *Fields* with a *Coronet* of *Trees*. They do likewise (and that with great commendation) make *hedges* of our *Genista spinosa*, prickly *Furzes*, of which they have a taller sort, such as the *French* employ for the same purpose in *Bretaigne*, where they are incomparable *hedges*.

15. It is to be *sown* (which is best) or *planted* of the *roots* in a furrow: If *sown*, *weeded* till it be strong: both *Tonsile*, and to be diligently *clip'd*, which will render it very thick, an excellent and beautiful *hedge*: Otherwise, permitted to grow at large, 'twill yield very good *Fagot*: It is likewise admirable *Cover* for *wild-fowle*, and will be made to grow even in moyle, as well as dry places: The young, and tender tops of *Furzes*, being a little bruise'd, and given to a lean, sickly *Horse*, will strangely recover and plump him. Thus, in some places, they *sow* in *barren grounds* (when they lay them down) the last *crop* with this *seed*, and so let them remain till they break them up again, and during that interim, reap considerable advantage: Would you believe (writes a worthy *Correspondent* of mine) that in *Herefordshire* (famous for plenty of wood) their *Thickets* of *Furzes* (*viz.* the vulgar) should yield them more profit than a like quantity of the best *Wheat* land of *England*? for such is theirs; If this be question'd, the *Scene* is within a mile of *Hereford*, and proved by *anniversary* experience, in the *Lands*, as I take it, of a *Gentleman* who is now one of the *Burgesses* for that *City*. And in *Devonshire* (the seat of the best *Husbands* in the *World*) they *sow* on their worst *Land* (well *plow'd*) the *seeds* of the rankest *Furzes*, which in four, or five years becomes a rich *Wood*: no provender (as we say) makes *Horses* so hardy, as the young tops of these *Furzes*; no other *Wood* so thick, nor more excellent *Fuel*; and for some purposes also, yielding them a kind of *Timber* to their more humble *buildings*, and a great refuge for *Fowl* and other *Game*: I am assur'd, in *Bretaigne* 'tis sometimes *sown* no less than *twelve yards* thick, for a speedy, profitable, and impenetrable *Mound*: If we imitated this *husbandry* in the barren places of *Surrey*, and other parts of this *Nation*, we might exceedingly spare our *woods*; and I have bought the best sort of *French-seed* at the shops in *London*. It seems that in the more *Eastern* parts of *Germany*, and especially in *Poland*, this vulgar trifle, and even our common *Broom* is so rare, that they have desired the *seeds* of them out of *England*, and preserve them with extraordinary care in their best *Gardens*; this I learn out of our *Johnsons Herbal*; by which we may consider, that what is reputed a *curse*, and

and a cumber in some places, is esteem'd the ornament and blessing of another: But we shall not need go so far for this, since both *Beech*, and *Birch* are almost as great strangers in many parts of this *Nation*, particularly *Northampton*, and *Oxfordshire*. Mr. Cook is much in praise of *Juniper* for *hedges*, especially for the more elegant *Incofures*.

15. This puts me in mind of the *Genista Scoparia*, *Broom*; *Broom*, another improvement for *Barren* grounds, and faver of more substantial *Fuel*: It may be *sown English*, or (what is more sweet, and beautiful) the *Spanish*, with equal success. In the *Western* parts of *France*, and *Cornwal*, it grows with us to an incredible height (however our *Poet* give it the epithet of *humilis*) and so it seems they had it of old, as appears by *Gratius* his *Genista Altimates*, with which (as he affirms) they us'd to make *staves* for their *spears*, and hunting *Darts*. The *Seeds* of *Broom* *Vomit*, and *Purge*, whilst the *Buds*, and *Flowers*, being pick'd, are very grateful.

16. Lastly, (*Sambucus*) a considerable *Fence* may be made of *Elder*, the *Elder*, let of reasonable lusty *truncations*; much like the *Willow*, and (as I have seen them maintain'd) laid with great curiosity, and far excelling those extravagant plantations of them about *London*, where the *tops* are permitted to grow without due, and skilful laying. There is a sort of *Elder* which has hardly any *Pith*; this makes exceeding stout *Fences*, and the *Timber* very useful for *Cogs* of *Stills*, *Butchers Skewers*, and such tough employments. Old trees do in time become firm, and close up the *hollowness* to an almost invisible *pith*. But if the *Medicinal* properties of the *Leaves*, *Bark*, *Berries*, &c. were thoroughly known, I cannot tell what our *Country-man* could aile, for which he might not fetch a *Remedy* from every *Hedge*, either for *Sickness* or *Wound*: The inner *Bark* of *Elder*, apply'd to any *burning*, takes out the *fire* immediately; That, or, in season, the *Buds*, boyl'd in *Water-greuel* for a *Break-fast*, has effected wonders in the *Fever*; and the *decoction* is admirable to assuage *Inflammations* and *tetrous* humors, and especially the *Scorbut*: But an *Extraſt*, or *Theriaca* may be compos'd of the *Berries*, which is not only efficacious to eradicate this *Epidemical* inconvenience, and greatly to assist *Longevity* (so famous is the story of *Neander*) but is a kind of *Catholicon* against all *Infirmities* whatever; and of the same *Berries* is made an incomparable *Spirit*, which drunk by it self, or mingled with *Wine*, is not only an excellent drink, but admirable in the *Dropsy*; In a Word, The *Water* of the *Leaves* and *Berries*, are approved in the *Dropsy*, every part of the *Tree* is useful, as may be seen at large, in *Blockwizius's Anatomie* thereof. The *Oyntment* made with the young *buds*, and *leaves* in *May* with *Butter*, is most sovereign for *Aches*, shrunk *Sinews*, *Hemorrhoids*, &c. and the *Flowers* macerated in *Vingar*, not only are of a grateful relish, but good to attenuate and cut raw, and gross humors. And less than this could I not say (with the leave of the charitable *Physician*) to gratifie our poor *Wood-man*; and yet when I have said all this, I do by no means

means commend the *scent* of it, which is very noxious to the *Air*, and therefore, though I do not undertake that all things which sweeten the *Air*, are salubrious, nor all ill favors pernicious; yet, as not for its beauty, so neither for its smell, would I plant *Elder*, or much *Box* near my Habitation, since we learn from *Biesius*, that a certain house in *Spain*, teated amongst many *Elder-trees*, diseas'd, and kill'd almost all the *Inhabitants*, which when at last they were grub'd up, became a very wholesome, and healthy place. The *Elder* does likewise produce a certain green *Fly*, almost invincible, which is exceedingly troublesome, and gathers a fiery redness where it attacks.

*Ris, de Avis
portate.*

Evonymus

19. There is a *Shrub* call'd the *Spindle-tree*, (*Evonymus*, or *Fusanum*) commonly growing in our *Hedges*, which bears a very hard wood, of which they sometimes made *Bowes* for *Viols*, and the *In-layer* us'd it for its colour, and *Instrument-makers* for *Tooth-ing* of *Organs*, and *Virginal-keys*, *Tooth-pickers*, &c. What we else do with it I know not, save that (according with its name, *abroad*) they make *spindles* with it. I also learn that three, or four of the *Berries*, purge both by *Vomit*, and *sege*, and the *powder* kills *Nits*, and *scurvy heads*. Here might come in (or be nam'd at least) the *Wild-Cornel*, or *Dog-wood*, good to make *Mill-Cogs*, *Pestles*, *Bolins* for *Bonellace*, *Butchers Skewers*, &c. Lastly, the *Viburnum*, or *Way-faring tree*, growing also plentifully in every corner, makes the most pliant, and best *bands* to *Fagot* with. The *Leaves*, and *Berries* are *astringent*, and make an excellent *Gargle* for *loose Teeth*, *sores Throats*, and stop *Fluxes*: The *leaves* decocted to a *Lie*, not only colour the *hairs* black, but fatten their *Roots*; and the *Bark* of the *Root*, macerated under ground, well beaten, and often boil'd, serves for *Birdlime*.

Tucca.

20. The *American Tucca* is a *hardier* plant than we take it to be; for it will suffer our sharpest *Winter*, as I have seen by experience, without that trouble, and care of setting it in *Cases* in our *Conservatories* for *hyemation*; such as have beheld it in *Flower* (which is not indeed till it be of some age) must needs admire the beauty of it; and it being easily multiplied, why should it not make one of the best, and most ornamental *Fences* in the world for our *Gardens*, with its natural *Palisadoes*, as well as the more tender, and impatient of moisture, the *Aloes*, does for their *Vineyards* in *Languedoc*, &c. but we believe nothing *improvable*, save what our *Grand-fathers* taught us. Finally, let trial likewise be made of that *Thorn*, mention'd by *Cap. Liggon* in his *History of Barbadoes*; whether it would not be made grow amongst us, and prove as convenient for *fences* as *there*; the *Seeds*, or *Sets*; transported to us with due care. And thus, having accomplish'd what (by your *Commands*) I had to offer concerning the propagation of the more *Solid*, *Material*, and useful *Trees*, as well the *Dry*, as *Aquatical*; and to the best of my *talent* fenc'd our *Plantation* in, I should here conclude, and set a *bound* likewise to my *Discourse*, by making an *Apologie* for the many *errors* and *impertinencies* of it; did not the *zeal*, and ambition of this *Illustrious Society* to promote, and improve

improve all *Attempts* which may concern *Publick utility* or *Ornament*, persuade *Me*, that what I am adding for the farther encouragement to the *planting* of some other *useful* (though less *Vulgar*) *Trees*, will at least obtain your *pardon*, if it mis of your *Approbation*.

21. To discourse in this *style* of all such *Fruit-trees* as would prove of great *emolument* to the whole *Nation*, were to design a just *Volume*; and there are *directions* already so many, and so accurately deliver'd and *publish'd* (but which cannot be affirm'd of any of the former *Classes* of *Forest-trees*, and other remarks, at the least to my poor knowledge and research) that it would be needless to Repeat.

22. I do only wish (upon the prospect, and meditation of the universal *Benefit*) that every *person* whatsoever, worth *ten pounds per annum*, within his *Majesties* Dominions, were by some indispensible *Statute*, oblig'd to plant his *Hedge-rows* with the best and most useful *kinds* of them; especially, in such places of the *Nation*, as being the more in-land *Counties*, and remote from the *Seas*, and *Navigable Rivers*, might the better be excus'd from the planting of *Timber*, to the proportion of those who are more happily, and commodiously situated for the transportation of it.

22. Undoubtedly, if this course were taken effectually, a very considerable part both of the *Meat*, and *Drink* which is spent to our prejudice, might be saved by the *Country-people*, even out of the *Hedges* and *Mounds*, which would afford them not only the pleasure, and profit of their delicious *Fruit*, but such abundance of *Cider*, and *Perry*, as should suffice them to drink of one of the most wholesome, and excellent *Beverages* in the *World*. Old Gerard did long since alledge us an example worthy to be pursu'd; I have seen (saith he, speaking of *Apple-Trees*, lib. 3. cap. 101.) in the *Pastures*, and *Hedge-rows* about the *Grounds* of a *Worshipful* Gentleman dwelling two miles from *Hereford*, call'd *Mr. Roger Bodnome*, so many *Trees* of all sorts, that the *Servants* drink for the most part no other drink but that which is made of *Apples*: The quantity is such, that by the report of the Gentleman himself, the *Parson* hath for *Tythe* many *Hogsheads* of *Cider*: The *Hogs* are fed with the fallings of them, which are so many, that they make choice of those *Apples* they do eat, who will not taste of any but of the best. An Example doubtless to be followed of Gentlemen that have Land and Living; but *Envy* saith, The *Poor* will break down our *Hedges*, and we shall have the least part of the *Fruit*; but forward in the Name of *God*, *Grass*, *Set*, *Plant*, and nourish up *Trees* in every corner of your *Ground*; the labour is small, the cost is nothing, the commodity is great; your *selves* shall have plenty, the *poor* shall have somewhat in time of want to relieve their necessity, and *God* shall reward your good minds and diligence. Thus far honest Gerard. And in truth, with how small a charge, and infinite pleasure this were to be effected, every one that is *Patron* of a little *Nursery*, can easily calculate: But by this *Expedient*, many thousands of *Acres*, sow'd now yearly with *Barley*, might be cultivated

vated for *Wheat*, or converted into *Pasture*, to the increase of *Corn*, and *Cattle*: Besides, the *Timber* which the *Pear-tree*, *Black-Cherry* afford, and many thorny *plums* (which are best for *grain*, *colour*, and *glass*) afford, comparable (for divers curious *Uses*) with any we have enumerated. The *Black-Cherry-Wood* grows sometimes to that bulk, as is fit to make *Stools* with, *Cabinets*, *Tables*, especially the *redder* sort, which will polish well; also *Pipes*, and *Musical Instruments*, the very *bark* employ'd for *Bee-Hives*: But of this I am to render a more ample *Account*, in the *Appendix* to this *Discourse*. I would farther recommend the more frequent planting, and propagation of *Fir*, *Pine-trees*, and some other beneficial *Materials*, both for *Ornament* and *profit*; especially, since we find by *experience*, they thrive so well, where they are cultivated for *Curiosity* only.

C H A P. XXII.

Of the Fir, Pine, Pinafter, Pitch-tree, &c.

Fir.

1. *A Bies, Pinus, Pinafter, Picea*, &c. are all of them easily rais'd of the *Kernels*, and *Nuts*, which may be gotten out of their *Cones* and *Clogs*, by exposing them a little before the *fire*, or in *warm water*, till they begin to gape, and are ready to deliver themselves of their numerous burthen.

2. There are of the *Fir* two principal *species*; the *Male*, which is the bigger Tree, most beautiful and tapering, and of a harder wood, and more hirsute *leaf*; and one sort which they call the *Spanish Fir*, bears its *leaf* like *Rosemary* with a white rib underneath, and this I suppose to be the *Female*, which is much the softer, and whiter. Though *whiteness* be not the best character. That which knowing *Workmen* call the *Dram*, and that comes to us from *Bergen*, *Swinjound*, *Moss*, *Longlound*, *Dranton*, &c. long, straight, clear, and of a yellow more *Cedrie* colour, is esteemed much before the *White* for *flooring* and *maincot*; For *Masts*, &c. those of *Prussia*, which we call *Spruce*, and *Norway* (especially from *Gottenberg*) are the best; unless we had more commerce of them from our *Plantations* in *New-England*, which are preferable to any of them; there lying rotting at present at *Pascataway*, a *Mast* of that prodigious dimensions, as no body will adventure to ship, and bring away.

The *Hemlock-tree* (as they call it in *New-England*) is a kind of *Spruce*: In the *Scottish Highlands* are *Trees* of wonderful altitude (though not altogether so tall, thick, and fine as the former) which grow upon places so unaccessible, and far from the *Sea*, that (as one says) they seem to be planted of *God* on purpose for *Nurseries* of *seed*, and monitors to our *Industry*, reserved with other *Blessings*,

ings, to be discover'd in our days amongst the new-invented *Improvements* of *Husbandry*, not known to our *Southern* people of this *Nation*, &c. Did we consider the pains they take to bring them out of the *Alps*, we should less stick at the difficulty of transporting them from the utmost parts of *Scotland*. To the former sorts we may add the *Esperund Fir*, *Tonsberry*, *Fredrickstad*, *Hellerone*, *Holmsirand*, *Landifer*, *Stavenger*, *Lawrat*, &c. There is likewise a kind of *Fir*, call'd in *Dutch* the *Green-boome*, much us'd in building of *Ships*, though not for *Men of War*; because of its lightness, and that it is not so strong as *Oak*; but yet proper enough for *Vessels* of great burden, and which stand much out of the *Water*: This sort comes into *Holland* from *Norway*, and other *Eastland* Countries; It is somewhat heavier yet than *Fir*, and stronger, nor do either of them bend sufficiently: As to the *Seeds*, they may be sown in *beds*, or *cases*, at any time during *March*; and when they peep, carefully defended with *Furzes*, or the like *fence*, from the rapacious *birds*, which are very apt to pull them up, by taking hold of that little *infecund* part of the *seed*, which they commonly bear upon their tops: The *Beds* wherein you sow them, had need be shelter'd from the *Southern Aspects*, with some *skreen* of *Reed*, or thick *hedge*: Sow them in shallow *rills*, not above half-inch-deep, and cover them with fine light mould: Being risen a finger in height, establish their weak *stalks*, by sifting some more earth about them; especially the *Pines*, which being more *top-heavy*, are more apt to sway. When they are of two, or three years growth, you may *transplant* them where you please; and when they have gotten good root, they will make prodigious shoots, but not for the three, or four first years comparatively. They will grow both in moist, or barren *Gravel*, and poor ground, so it be not over *sandy* and light, and want a *loamy* ligature; but before sowing (I mean here for large designs) turn it up a foot deep, sowing, or setting your *Seeds* an hand distance, and riddle Earth upon them; In five, or six weeks they will peep: When you *transplant*, water them well before, and cut the *clod* out about the *root*, as you do *Melons* out of the *Hot-bed*, which knead close to them like an *Egg*: Thus they may be sent safely many *miles*, but the *top* must neither be bruised, much less cut, which would *dwarf* it for ever: One kind also will take of *slips* or *layers* inter'd about the latter end of *August*, and kept moist.

3. The best time to transplant, were in the beginning of *April*; they would thrive mainly in a stiff, hungry *Clay* or rather *loam*; but by no means in over light, or rich *Soil*: Fill the holes therefore with such barren *Earth*, if your ground be improper of it self; and if the *Clay* be too stiff, and untractable, with a little *sand*, removing with as much *Earth* about the *roots* as is possible, though the *Fir* will better endure a naked *transplantation*, than the *Pine*: If you be necessitated to plant towards the latter end of *summer*, lay a pretty deal of horse *litter* upon the surface of the ground, to keep off the heat, and in *Winter* the cold; but let no *dung* touch either stem, or root: You may likewise sow in such earth about

February,

February, they will make a shoot the very first year of an *Inch*; next an handful, the third year three foot, and thence forward, above a yard annually. A Northern Gentleman (who has oblig'd me with this process upon his great Experience) assures me, that there are trees planted in *Northumberland*, which are in few years grown to the magnitude of *Ship-masts*; and from all has been said, deduces these *Incentivements*: 1. The facility of their propagation; 2. The nature of their growth, which is to affect places where nothing else will thrive; 3. Their uniformity and beauty; 4. Their perpetual *Verdure*; 5. Their sweetness; 6. Their fruitfulness, affording seed, gum, fuel, and timber of all other woods the most useful, and easy to work, &c. All which highly recommend it as an excellent Improvement of Husbandry, fit to be enjoy'd by some solemn Edit, to the Inhabitants of this our Island, that we may have masts, and those other materials of our own growth.

Pines.

4. The *Pine* (of which are reckon'd no less than ten several sorts, preferring the *Domestic*, or *Sative* for the fuller growth) is likewise of both Sexes, whereof the *Male* growing lower, hath its wood more knotty, and rude than the *Female*. They would be gather'd in *June*, before they gape, yet having hung two years (for there will be always some ripe, and some green on the same Tree) preserve them in their nuts, in sand, as you treat *Acorns*, &c. till the season invite, and then set, or sow them in Ground which is cultivated like the *Fir*, in most respects; only, you may bury the Nuts a little deeper. By a friend of mine, they were rolled in a fine compost made of *Sheeps dung*, and scatter'd in February, and this way never fail'd *Fir* and *Pine*; they came to be above *Two* high by *May*; and a Spanish Author tells us, that to macerate them five days in a child's urine, and three days in water, is of wonderful effect; This were an expeditious process for great Plantations; unless you would rather let the *Pine* as they do *Pease*, but at wider distances, that when where is occasion of removal, they might be taken up with earth and all, I say, taken up, and not remov'd by *Evulsion*; because they are (of all other Trees) the most obnoxious to miscarry without this caution; and therefore it were much better (where the Nuts might be commodiously set, and defended) never to remove them at all, it gives this Tree so considerable a check. The safest course of all, were to set the Nuts in an Earthen-pot, and in frosty weather, shewing it a little to the fire, the intire Clod will come out with them, which are to be reserved, and set in the naked Earth, in convenient and fit holes prepar'd before hand, or so soon as the thaw is universal: Some commend the strewing a few Oats at the bottom of the fosses or pits in which you transplant the naked roots, for a great promotion of their taking, and that it will cause them to shoot more in one year than in three; but to this I have already spoken.

5. I am assur'd (by a person most worthy of credit) that in the Territory of *Alzey* (a Country in Germany, where they were miserably distressed for Wood, which they had so destroy'd as that they were reduced to make use of *Straw* for their best Fuel) a very

very large *Træ* being newly plow'd, but the *Wars* surprizing them, not suffer'd to low, there sprung up the next year a whole Forest of *Pine-trees*, of which sort of Wood there was none at all, within less than *four-score* miles; so as 'tis verily conjectur'd by some, they might be wafted thither from the Country of *Westphalia*, which is the nearest part to that where they grow: If this be true, we are no more to wonder, how, when our *Oak-woods* are grubb'd up, *Beech*, and Trees of other kind, have frequently succeeded them: What some impetuous Winds have done in this nature, I could produce instances almost miraculous: I shall say nothing of the opinion of our Master *Varro*, and the learned *Theophrastus*, who were both of a faith, that the seeds of Plants drop'd out of the Air: *Pliny* in his 16. Book, Chap. 33. upon discourse of the *Cretan Cypress*, attributes much to the indoles, and nature of the soil, virtue of the Climate, and Impressions of the Air: And indeed it is very strange, what is affirm'd of that *Pitchy-rain*, (reported to have fallen about *Cyrene*, the year 430. U. C.) after which, in a short time, sprung up a whole wood of the Trees of *Laserpitium*, producing a precious Gum, not much inferior to *Benzoin*, if at least the story be warrantable: But of these Aerial irradiations, various conceptions, and equivocal productions without seed, &c. upon another occasion, if life and leisure permit me to finish what has been long under the hand and file, to gratifie our Horticultores; this present Treatise being but an imperfect limb, of that more ample Work.

6. In transplanting of these *Coniferous* Trees, which are generally *Resnaceous*, viz. *Fir*, *Pine*, *Larix*, *Cedar*, and which have but thin, and single Roots, you must never diminish their heads, nor be at all busie with their roots, which pierce deep, and is all their foundation, unless you find any of them bruised, or much broken; therefore such down right Roots as you may be forc'd to cut off, it were safe to scar with an hot Iron, and prevent the danger of bleeding, to which they are obnoxious even to destruction, though unseen, and unheeded: Neither may you disbranch them, but with great caution, as about *March*, or before, or else in *September*, and then 'tis best, to prune up the side-branches close to the Trunk, cutting off all that are above a year old; if you suffer them too long, they grow too big, and the cicatrice will be more apt to spend the Tree in gumme; upon which accident, I advise you to rub over their wounds with a mixture of *Cow-dung*; the neglect of this cost me dear, so apt are they to spend their Gum. Some advise us to break the shells of *Pines*, to facilitate their delivery, and I have essay'd it, but to my loss; Nature does obstetricate, and do that office of her self, when it is the proper season; neither does this preparation at all prevent those which are so buried, whilst their hard Integuments protect them both from rotting, and the Vermin.

7. The domestic *Pine* grows very well with us, both in Mountains, and Plains; but the *Pinafter*, or wilder (of which are four sorts) best for *Walks*; because it grows tall, and proud, maintain-
ing

ing their Branches at the sides, which the *Pine* does less frequently. There is in *New-England*, a very broad *Pine*, which increases to a wonderful bulk and magnitude, inasmuch as large *Canoes* have been excavated out of the body of it, without any addition.

8. The *Fir* grows tallest, being planted reasonable close together; but suffers nothing to thrive under them. The *Pine* not so *In-hospitable*; for (by *Plinius*'s good leave) it may be sown with any *Tree*, all things growing well under its *shade*, and excellent in *Woods*; hence *Clandian*,

The friendly *Pine* the mighty *Oak* invites.

Et comitem quercum Pinus amica trahit.

9. They both affect the cold, high, and rocky grounds, *Abies* in montibus altis; Those yet which grow on the more *Southern*, and less expos'd quarters, a little visited with the beams of the *Sun*, are found to thrive beyond the other, and to afford better *Timber*; and this was observ'd long since by *Vitruvius* of the *Infernales* (as he calls them) in comparison with the *Supernates*, which growing on the *Northern* and shady side of the *Apennines*, were nothing so good, which he imputes to the want of due digestion. They thrive (as we said) in the most sterile places, yet will grow in better, but not in over-rich, and *pinguid*. The worst Land in *Wales* bears (as I am told) large *Pines*; and the *Fir* according to his aspiring nature, loves also the *Mountain* more than the *Valley*; but *ὁ τοῖς πεδίοις ἔδωκεν ἔσπερον*, it cannot endure the *shade*, as *Theophrastus* observes, de Pl. l. 4. c. 1. But this is not rigidly true; for they will grow in *Consort*, till they even shade, and darken one another, and will also descend from the *Hills*, and succeed very well, being desirous of plentiful *waterings*, till they arrive to some competent *stature*; and therefore they do not prosper so well in an over sandy, and hungry Soil, or gravel, as in the very entrails of the *Rock*, which afford more *drink* to the *Roots*, that penetrate into their meanders, and winding recesses. But though they require this refreshing at first, yet do they perfectly abhor all *stercoration*; nor will they much endure to have the earth open'd about their *Roots* for *Ablagation*, or be disturb'd: This is also to be understood of *Cypresses*. A *Fir* for the first half dozen years, seems to stand, or at least make no considerable advance; but it is when thoroughly rooted, that it comes away miraculously. That Honourable Knight Sir Norton Knatchbull (whose delicious Plantation of *Pines*, and *Firs* I beheld with great satisfaction) having assur'd me that a *Fir-tree* of his raising, did shoot no less than sixty foot in height, in little more than twenty years; and what are extant at Sir Peter Wentworths of *Lillingston Lovel*; *Cornbury* in *Oxfordshire*, and other places; but especially those *Trees* growing now in *Harefield Park* in the County of *Middlesex* (belonging to Mr. *Serjeant Nudigate*) where there are two *Spanish*, or *Silver Firs*, that at two years growth from the seed, being planted there Anno 1603. are now become goodly *Masts*: The biggest of them from the ground, to the upper bough, is 81 feet, though forked on the top, which has not a little impeded its growth: The *Girt*, or *Circumference*

circumference below, is thirteen foot, and the length (so far as is *Timber*, that is, to six inches square) 73 foot, in the middle 17 inches square, amounting by calculation to 146 foot of good *Timber*: The other *Tree* is indeed not altogether so large, by reason of its standing near the *House* when it was burnt (about 22 years since) when one side of the *Tree* was scorched also; yet it has not only recover'd that scar, but thrives exceedingly, and is within eight or nine foot, as tall as the other, and would probably have been the better of the two, had not that impediment happen'd, it growing so taper, and erect, as nothing can be more beautiful: This I think (if we had no other) is a pregnant instance, as of the speedy growing of that material; so of all the encouragement I have already given for the more frequent cultivating this ornamental, useful, and profitable *Tree*, abounding doubtless formerly in this *Country* of ours, if what a grave, and authentick *Author* writes be true, *Athenaeus* relating, that the stupendious *Vessel*, built so many ages since by *Hiero*, had its *Mast* out of *Britain*. Take notice that none of these mountainous *Trees* should be planted deep; but as shallow as may be for their competent support.

10. The *Picea* is another sort of *Pine*, and to be cultivated like it, the cold ground which these *Plants* most affect, though it be hard to discover,

Yet sometimes *Pitch-trees* and the noxious *Tew*,
Or the dark *Joy* will dire Symptoms shew.

*Picea tantum, taxique nocens
Interdum, aut edere pandunt Vistigia nigra.*

Geo. 2.

And therefore I am not satisfied why it might not prosper in some tolerable degree in *England*, as well as in *Germany*, *Russia*, the Colder *Tracts*, and abundantly in *France*: It grows on the *Alpes* among the *Pine*, but neither so tall, nor so upright, and produces a *Gum* almost as white, and firm as *Frankincense*: But it is the *Larix* (another sort of *Pine*) that yields the true *Venetian Turpentine*.

11. There is also the *Piceaster* (a wilder sort) out of which the greatest store of *Pitch* is boyl'd. The *Teda* likewise, which is a sort abounding in *Dalmatia*, more unctuous, and more patient of the warmer situations, and so inflammable, that it will sit into *Candles*, and therefore some will by no means admit it to be of a different *Species*, but a *metamorphosis* of over-grown fatness, to which the most judicious incline. But of these, the *Grand Canaries* (and all about the Mountains near *Tenariff*) are full, where the Inhabitants do usually build their *Houses* with the *Timber* of the *Pitch-Tree*; They cut it also into *Wainscot*, in which it succeeds marvellously well; abating that it is so obnoxious to *fire*, that when ever a house is attack'd, they make all imaginable hast out of the *Conflagration*, and almost despair of extinguishing it: They there also use it for *Candle-Wood*, and to travel in the night by the light of it, as we do by *Links*, and *Torches*; nor do they make these *Tees* (as the *Spaniards* call them) of the Wood of *Pine* alone, but of other *Trees*, as of *Oak*, and *Hazel* which they

cleave and hack, and then *die* in the *Oven*, or *Chimney*, but have certainly some unctuous, and inflammable matter, in which they afterwards dip it; but thus they do in *Elfay*, as I am credibly inform'd.

12. The *Bodies* of these being cut, or burnt down to the ground, will emit frequent *Suckers* from the *Roots*; but so will neither the *Pine*, nor *Fir*: But the *Fir* may be propagated of *Layers*, which I divulge, as a considerable *Secret* that has been essay'd with success.

13. That all these, especially the *Fir*, and *Pine*, will prosper well with us, is more than probable, because it is a kind of *Demonstration*, that they did heretofore grow plentifully in *Cumberland*, *Cheshire*, *Stafford*, and *Lancashire*, if the multitudes of these *Trees* to this day found intire, and buried under the *Earth*, though suppos'd to have been o'rethrown, and cover'd so ever since the universal *Deluge*, be indeed of this *Species*: The Learned Dr. *Merrett*, in his *Pinax*, speaks of several places of this *Nation*, where *subterraneous-Trees* are found; as namely, in *Cornwall*, *ad finem terre*, in *agris Flint*; in *Penbroke-shire* towards the shore, where they so abound, *ut totum littus* (says the Doctor) *tangam Sylva cadua appareat*; in *Cheshire* also (as we said) *Cumberland*, and *Anglesey*, and several of our *Euro-boreal* tracts, and are called *Noahs-Ark*. By *Charnesse* in *Lancashire* (says *Cambden*) the low *Mossie* ground was no very long time since, carried away by an impetuous *flood*, and in that place now lies a low irriguous *Vale*, where many prostrate *Trees* have been digg'd out: And from another I receive, that in the *Moors* of *Somerfetshire* (towards *Bridgewater*) some lengths of *Pasture* growing much wither'd, and parched more than other places of the same ground, in a great drowth, it was observ'd to bear the length, and shape (in gross) of *Trees*; They digg'd, and found in the spot *Oaks*, as black as *Ebony*, and have been from hence instructed, to take up many hundreds of the same kind: This might be of good use for the like detections in *Essex*, *Lincoln-shire*, and places either low situate, or adjacent to the *Sea*; also at *Binsfeld* heath in *Kent*, &c. These *Trees* were (some think) carried away in times past, by some accident of *Inundation*, or by *Waters* undermining the ground, till their own *weight*, and the *Winds* bow'd them down, and overwhelm'd in the *Mud*: For 'tis observ'd, that these *Trees* are no where found so frequently, as in *Boggie* places; but that the burning of these *Trees* so very bright, should be an *Argument* they were *Fir*, is not necessary, since the *Bituminous* quality of such *Earth*, may have imparted it to them; and *Cambden* denies them to be *fir-trees*, suggesting the *Querie*; Whether there may not possibly grow *Trees* even under the *Ground*, as well as other things? There are in *Cumberland*, on the *Sea-shore*, *Trees* sometimes discover'd at *Low-water*, and at other times that lye buried in the *Sands*; and in other *Mossie* places of that *County*, 'tis reported, the People frequently dig up the *Bodies* of vast *Trees* without *Boughs*, and that by direction of the *Dew* alone in *Summer*; for they observe

observe it never lyes upon that part, under which those *Trees* are interr'd. These particulars I find noted by the Ingenious *Author* of the *Britannia Baconica*. How vast a *Forest*, and what goodly *Trees* were once standing in *Holland*, and those *Low-countries*, till about the Year 860, that an *Hurricane* obstructing the mouth of the *Rhine* near *Catwic*, made that horrid devastation, good *Authors* mention; and they to this day find monstrous *bodies*, and *branches*, (nay with the very *Nuts*, most intire) of prostrate, and buried *Trees*, in the *Veene*, especially towards the *South*, and at the bottom of the *Waters*: Also near *Bruges* in *Flanders*, whole *Woods* have been found twenty *Ells* deep, in which the *Trunks*, *Boughs*, and *Leaves* do so exactly appear, as to distinguish their several *Species*, with the *Series* of their *Leaves* yearly falling; of which see *Boetius de Boot*.

Dr. *Plot* in his *Nat. Hist.* of *Oxford-shire* mentions divers *Subterraneous Oaks*, black as *Ebony*, quite through the whole substance of the *Timber*, caus'd (as he supposes, and learnedly evinces) by a *Vitriolic* humour of the *Earth*; of affinity to the nature of the *Ink-Galls*, which that kind of *Tree* produces: Of these he speaks of some found sunk under the ground, in an upright, and growing posture, to the perpendicular depth of sixty foot; of which one was three foot diameter, of an hardness emulating the politest *Ebony*: But these *Trees* had none of them their *Roots*, but were found plainly to have been cut off by the *kerf*: There were great store of *Hassel-Nuts*, whose shells were as found as ever, but no *kernel* within. It is there the learned *Author* gives you his conjecture, how these deep *Interrments* happen'd; namely by our *Ancesters* (many *Ages* since) clearing the Ground for *Village*, and when *Wood* was not worth converting to other uses, digging *Trenches* by the sides of many *Trees*, in which they buried some; and others they slung into *quagmires*, and *Lakes* to make room for more profitable *Agriculture*: But I refer you to the *Chapter*. In the mean time, concerning this *Mossie-Wood* (as they usually terme it, because, for the most part dug-up in *Mossie*, and *Moory-bogs* where they cut for *Turf*) it is highly probable (with the learned Mr. *Ray*) that these places were many *ages* since, part of *Firm-land* covered with *Wood*, afterwards undermined, and overwhelmed by the violence of the *Sea*, and so continuing submerg'd, till the *Rivers* brought down *Earth*, and *Mud* enough to cover the *Trees*, filling up the shallows, and restoring them to the *Terra-firma* again, which he illustrates from the like Accident upon the Coast of *Suffolk*, about *Dunwich*, where the *Sea* does at this day, and hath for many years past, much inroach'd upon the Land, undermining, and subverting by degrees, a great deal of high-ground; so as by ancient Writings it appears, a whole *Wood* of more than a *mile* and half, at present is so far within the *Sea*: Now if in succeeding *Ages* (as probable it is enough) the *Sea* shall by degrees be fill'd up, either by its own working, or by *Earth* brought down by *Land-Floods*, still subsiding to the bottom, and surmounting the tops of these *Trees*, and so the space again added to the

the *Firm-land*; the *Men* that shall then live in those parts, will, it's likely, dig-up these *Trees*, and as much wonder how they came there, as we do at present those we have been speaking of: But we shall enquire farther concerning these *Subterranean* Productions anon, and whether the *Earth*, as well as the *Water*, have not the virtue of strange *Transmutations*: These *Trees* are found in *Moors*, by poking with *Staves* of three or four foot length, shod with *Iron*.

14. In *Scotland* (as we noted) there is a most beautiful sort of *Fir*, or rather *Pine* (some think it the *Spanish Pinaster*) growing upon the *Mountains*; of which, from the late *Marquess of Argyll*, I had sent me some seeds, which I have sown with tolerable success; and I prefer them before any other, because they grow both very erect, and fixing themselves stoutly, need little, or no support. And there near *Loughbrunn*, 'twixt the *Lough*, and an *Hill*, they grow in such quantity; that from the spontaneous Fall, Ruine, and Decay of the *Trees* lying cross one another to a Man's height, partly cover'd with *Mosse*, and partly *Earth*, and *Grass* (which rots, fills up, and grows again) a considerable *Hill* has in process of time been raised to almost their very tops, which being an Accident of singular remark, I thought fit to mention.

15. For the many, and almost universal use of these *Trees*, both *Sea* and *Land* will plead,

The useful *Pine* for Ships

— *Arct. uile Lignum*
Navigis Pinos —

Georg. 2.

Hence *Papinius* 6. *Thebaid.* calls it *andax abies*. They make our best *Mast*, *Sheathing*, *Scaffold-poles*, &c. heretofore the whole *Vessel*: It is pretty (saith *Pliny*) to consider, that those *Trees* which are so much sought after for Shipping, should most delight in the highest of *Mountains*, as if it fled from the *Sea* on purpose, and were afraid to descend into the *Waters*. With *Fir* we likewise make all intestine works, as *Wainscot*, *Floors*, *Pales*, *Balks*, *Laths*, *Boxes*, *Bellies* for all *Musical Instruments* in general, nay the *Ribs*, and *Sides* of that enormous *Stratagem*, the so famous *Trojan Horse*, may be thought to be built of this *Material*, and if the *Poet* mistake not,

— The *Ribs* with *Deal* they fit.

— *Silvaque intextum Abiete costat.*

Æn. 2.

In *Holland* they receive their best *Masts* out of *Norway*, and even as far as *Moscow*, which are best esteemed, (as consisting of long *fibers*, without *knots*) but *Deal-boards* from the *first*; and though *Fir* rots quickly in *Salt-Water*, it does not so soon perish in *fresh*; nor do they yet refuse it in *Merchant-Ships*, especially the upper-parts of them, because of its lightness: The true *Pine* was ever highly commended by the *Antients* for *Naval Architecture*, as not so easily decaying; and we read that *Trajan* caus'd *Vessels* to be built both of the true, and *spurious* kind well pitch'd, and over-laid with *lead*, which perhaps might hint our modern

modern *Sheathing* with that *Metal* at present. *Fir* is exceeding smooth to *polish* on, and therefore does well under *Gilding* work, and takes *black* equal with the *Pear-tree*: Both *Fir*, and especially *Pine*, succeed well in *Carving*, as for *Capitels*, *Festoons*, nay *Statues*, especially being *Gilded*, because of the easiness of the *Grain*, to work, and take the *Tool* every way; and he that shall examine it nearly, will find that famous *Image* of the *B. Virgin* at *Loretto* (reported to be Carved by the hands of *S. Luke*) to be made of *Fir*, as the grain easily discovers it: The *Tornalus* (as *Vitruvius* terms it) and *heart* of *Deal*, kept dry, rejecting the *Albumen* and white, is everlasting; nor does there any *Wood* so well agree with the *glue*, as it, or is so easie to be wrought: It is also excellent for *Beams*, and other *Timber-work* in *Houses*, being both light, and exceedingly strong, and therefore of every good use for *Barrs*, and *bolts* of *Doors*, as well as for *Doors* themselves, and for the beams of *Coaches*, a board of an *Inch* and half thick, will carry the *body* of it with great ease, by reason of a natural *Spring* which it has, not easily violated: You shall find, that of old they made *Carts*, and *Coaches* of it: and for *Piles* to superstruct on in *boggy grounds*, most of *Venice*, and *Amsterdam* is built upon them, with so excessive charge, as some report, the *foundations* of their *houses* cost as much, as what is erected on them; there being driven-in no fewer than 13659 great *Masts* of this *Timber*, under the new *Stadt-house* of *Amsterdam*. For *Scaffolding* also there is none comparable to it; and I am sure we find it an extraordinary favor of *Oak*, where it may be had at reasonable price. I will not complain what an incredible mass of ready *Money*, is yearly exported into the *Northern Countries* for this sole Commodity, which might all be saved were we *industrious* at home, or could have them out of *Virginia*, there being no Country in the whole World stor'd with better; besides, another sort of *Wood* which they call *Cypress*, much exceeding either *Fir*, or *Pine* for this purpose; being as tough, and springy as *Tew*, and bending to admiration; it is also lighter than either, and everlasting in *wet*, or *dry*; so as I much wonder, that we enquire no more after it: In a word, not only here, and there an *house*, but whole *Towns*, and great *Cities* are, and have been built of *Fir* only; not that alone in the *North*, as *Mosco*, &c. where the very *Streets* are pav'd with it, (the *bodies* of the *Trees* lying prostrate one by one in manner of a *Raft*) but the renowned *City* of *Constantinople*; and nearer home *Tholose* in *France* was within little more than an hundred years, most of *Fir*, which is now wholly *Marble* and *Brick* after 800 houses had been burnt, as it often chances at *Constantinople*, but where no accident even of this devouring nature, will at all move them to re-edifice with more lasting *Materials*: To conclude with the uses of *Fir*, we have most of our *Pot-Ashes* of this *Wood*, together with *Torch*, or *Funebral-Staves*; nay, and of old, *spears* of it, if we may credit *Virgil's Amazonian* Combate.

— She

—She preſt
A long Fir Spear through his expoſed Breaſt.

—Cuius apertum
Advenſi longâ tranſverberat abſte pectus.

Æn. 11.

Laſtly, the very *Chips*, or *Shavings* of *Deal-boards*, are of other uſe than to kindle *Fires* alone: *Thomas Bartholinus* in his *Medicina Danorum Diſſert.* 7. &c. where he diſclaims the uſe of *Hops* in *Beer*, (as pernicious and malignant, and from ſeveral inſtances how apt it is to produce and uſher in *Infeſtions*, nay, *Plagues*, &c.) would ſubſtitute in its place, the *Shavings* of *Deal-boards*, as he affirms, to give a grateful *odor* to the *Drink*; and how ſoverain thoſe *reſinous-woods*, the *Tops* of *Fir*, and *Pines* are againſt the *Scorbut*, *Gravel* in the *Kidneys* &c. we generally find: It is in the ſame *Chapter*, that he commends alſo *Wormwood*, *Marrubium*, *Chameleagnum*, *Sage*, *Tamarifc*, and almoſt any thing, rather than *Hops*. The *bark* of the *Pine* heals *Ulcers*; and the inner *rind* cut ſmall, contuſ'd, and boil'd in ſtore of *water*, is an excellent remedy for burns and ſcalds, waſhing the ſore with the decoction, and applying the ſoftened *bark*: It is alſo ſoverain againſt frozen and benum'd limbs: The diſtill'd *water* of the green *Cones* takes away the wrinkles of the *face*, dipping cloaths therein, and laying them on it becomes a *Cosmetic* not to be deſpiſ'd. The *Pine*, or *Picea* buried in the Earth never decay: From the latter tranſudes a very bright, and pellucid *Gum*; hence we have likewiſe *Rofin*; alſo of the *Pine* are made *Boxes* and *Barrels* for dry Goods; yea, and it is cloven into *Shingles* for the covering of Houſes in ſome places; alſo *Hoops* for *Wine-veſſels*, eſpecially of the eaſily flexible *Wild-pine*; not to forget the *Kernels* (this *Tree* being always furniſh'd with *Cones*, ſome ripe, others green) of ſuch admirable uſe in *Emulſions*; and for *Tooth-pickers*, even the very *leaves* are commended: In ſum, they are *Plantations* which exceedingly improve the *Air*, by their *odoriferous*, and *balsamical* emiſſions, and for ornament, create a perpetual *Spring* where they are plentifully propagated. And if it could be proved that the *Almugim-trees*, Recorded 1 Reg. 10. 12. (whereof *Pillars* for that famous *Temple*, and the *Royal Palace*, *Harps*, and *Psalteries*, &c. were made) were of this ſort of *Wood* (as ſome doubt not to aſſert) we ſhould eſteem it at another rate; yet we know *Joſephus* affirms they were a kind of *Pine-tree*, though ſomewhat reſembling the *Fig-tree* wood to appearance, as of a moſt luſtrious *Candor*. In the 2 Chron. 2. 8. there is mention of *Almug-trees* to grow in *Lebanon*; and if ſo, methinks it ſhould rather be a kind of *Cedar*; (yet we find *Fir* alſo in the ſame period) for we have ſeen a whiter ſort of it, even very white as well as red; though ſome affirm it to be but the *Sap* of it (ſo our *Cabinet-makers* call it) I ſay, there were both *Fir*, and *Pine-trees* alſo growing upon thoſe *Mountains*, and the learned *Meibonius*, (in that curious Treatiſe of his *De Fabrica Triremium*) ſhews, that there were ſuch *Trees* brought out of *India*, or *Ophir*. In the mean time Mr. *Purchas* informs us, that Dr. *Dee* writ a laborious *Treatiſe* almoſt wholly of this ſubject (but I could never have the good hap

to

to ſee it) wherein, as *Commiſſioner* for *Solomon's Timber*, and like a Learned *Architeſt*, and *Planter*, he has ſummon'd a *Jury* of twelve ſorts of *Trees*; namely, 1. the *Fir*, 2. *Box*, 3. *Cedar*, 4. *Cypreſs*, 5. *Ebony*, 6. *Aſh*, 7. *Juniper*, 8. *Larch*, 9. *Olive*, 10. *Pine*, 11. *Oak*, and 12. *Sandal-trees*, to examine which of them were this *Almugin*, and at laſt ſeems to concur with *Joſephus*, in favour of *Pine*, or *Fir*; who poſſibly, from ſome antient *Record*, or fragment of the *Wood* it ſelf, might learn ſomething of it; and 'tis believ'd, that it was ſome material both *odoriferous* to the *Scent*, and *beautiful* to the *Eye*, and of fitteſt temper to reſtract *Sounds*; beſides its ſerviceableneſs for *Building*, all which Properties are in the beſt ſort of *Pine* or *Thyina*, as *Pliny* calls it; or perhaps ſome other rare *Wood*, of which the *Eastern Indies* are doubtleſs the beſt provided; and yet I find, that theſe vaſt beams which ſuſtain'd the Roof of S. *Peter's Church* at *Rome*, laid (as reported) by *Conſtantine the Great*, were made of the *Pitch-tree*, and have laſted from *Anno* 336. down to our days, above 1300. years.

16. But now whiles I am reciting the *Uſes* of theſe beneficial *Trees*, Mr. *Winthorp* preſents the *Royal Society* with the *Proceſs* of making the *Tar*, and *Pitch* in *New-England*, which we thus abbreviate. *Tar* is made out of that ſort of *Pine-tree*, from which naturally *Turpentine* exſtilleth; and which at its firſt flowing out, is liquid and clear; but being hardened by the *Air*, either on the *Tree*, or where-ever it falls, is not much unlike the *Burgundy Pitch*; and we call them *Pitch-pines* out of which this *gummy* ſubſtance tranſudes: They grow upon the moſt barren plains, on *Rocks* alſo, and *Hills* riſing amongſt thoſe *Plains*, where ſeveral are found blown down, that have lain ſo many *Ages*, as that the whole *Bodies*, *Branches*, and *Roots* of the *Trees* being perished, ſome certain knots only of the *Boughs* have been left remaining intire (theſe knots are that part where the *bough* is join'd to the body of the *Tree*) lying at the ſame diſtance and poſture, as they grew upon the *Tree* for its whole length. The *Bodies* of ſome of theſe *Trees* are not corrupted through age, but quite conſum'd, and reduc'd to aſhes, by the annual burnings of the *Indians*, when they ſet their grounds on fire; which yet has, it ſeems, no power over theſe hard knots, beyond a black ſcorching; although being laid on heaps, they are apt enough to burn. It is of theſe knots they make their *Tar* in *New-England*, and the *Country* adjacent, while they are well impregnated with that *Terebinthine*, and *Reſinous* matter, which like a *Balsom*, preſerves them ſo long from putrefaction. The reſt of the *Tree* does indeed contain the like *Terebinthine Sap*, as appears (upon any ſlight incision of bark on the ſtem, or boughs) by a ſmall cryſtalline pearl which will ſweat out; but this, for being more watery, and undigeſted by reaſon of the poroſity of the *Wood*, which expoſes it to the impreſſions of the *Air* and *Wet*, renders the *Tree* more obnoxious; eſpecially, if it lie proſtrate with the bark on, which is a receptacle for a certain *Interſtaneous Worm*, that accelerates its decay. They

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are

are the *knots* then alone, which the *Tar-makers* amass in *heaps*, *spr*ying them in *Carts* to some convenient place not far off, where finding *Clay*, or *Loam* fit for their turn, they lay an *Hearth* of such ordinary stone as they have at hand: This, they build to such an height from the level of the ground, that a *Vessel* may stand a little lower than the *Hearth*, to receive the *Tar* as it runs out: But first, the *Hearth* is made wide, according to the quantity of *knots* to be set at once, and that with a very smooth *floor* of *Clay*, yet somewhat descending, or dripping from the extream parts to the *middle*, and *thence* towards one of the *sides*, where a *gullet* is left for the *Tar* to run out at. The *Hearth* thus finish'd, they pile the *knots* one upon another, after the very same manner as our *Colliers* do their wood for *Char-coal*; and of a height proportionable to the breadth of the *Hearth*; and then cover them over with a coat of *loam*, or *clay* (which is best) or in defect of those, with the best, and most tenacious *Earth* the place will afford; leaving only a small *spinnacle* at the top, whereto to put the *fire* in; and making some little *holes* round about at several heights, for the admission of so much *air*, as is requisite to keep it burning, and to regulate the *fire*, by opening, and stopping them at pleasure. The *process* is almost the same with that of making *Char-coal*, as will appear in due place; for, when it is well on *fire*, that middle *hole* is also stopp'd, and the rest of the *Registers* so govern'd, as the *knots* may keep burning, and not be suffocated with too much *smoak*; whiles all being now through-heated, the *Tar* runs down to the *Hearth*, together with some of the more watry *sap*, which hastning from all *parts* towards the *middle*, is convey'd by the fore-mention'd *gutter*, into the *Barrel*, or *Vessel* placed to receive it: Thus, the whole *Art* of *Tar-making* is no other, than a kind of rude distillation *per descensum*, and might therefore be as well done in *Furnaces* of large capacity, were it worth the expence. When the *Tar* is now all melted out, and run, they stop up all the *vents* very close; and afterwards find the *knots* made into excellent *Char-coal*, prefer'd by the *smiths* before any other whatsoever, which is made of wood; and nothing so apt to burn out when their *blast* ceaseth; neither do they *sparkle* in the *fire*, as many other sorts of *Coal* do; so as, in defect of *Sea-coal*, they make choice of *this*, as best for their use, and give greater prices for it. Of these *knots* likewise do the *Planters* split out small *stivers*, about the thickness of one's *finger*, or somewhat thinner, which serve them to burn in stead of *Candles*; giving a very good light. This they call *Candle-wood*, and it is in much use both in *New-England*, *Virginia*, and amongst the *Dutch planters* in their *Villages*; but for that it is something offensive, by reason of the much fuliginous *smoak* which comes from it, they commonly burn it in the *chimney-corner*, upon a flat *stone* or *Iron*; except, occasionally, they carry a single *stick* in their hand, as there is need of light to go about the house. It must not be conceiv'd, by what we have mention'd in the former description of the *knots*, that they are only to be separated from the *bodies* of the trees by devouring *time*, or that they are the only *materials*, out of which

Tar

Tar can be extracted: For there are in these *Tracts*, millions of *Trees* which abound with the same sort of *knots*, and full of *Turpentine* fit to make *Tar*: But the labour of *filling* these *Trees*, and of *cutting* out their *knots*, would far exceed the value of the *Tar*; especially, in *Countries* where *Workmen* are so very dear: But those *knots* above mention'd, are provided to hand, without any other labour, than the gathering only. There are sometimes found of those sort of *Pine-trees*, the lowest part of whose stems towards the *root* is as full of *Turpentine*, as the *knots*; and of these also may *Tar* be made: but such *Trees* being rarely found, are commonly preserved to split into *Candle-wood*; because they will be easily *riven* out into any lengths, and scantlings desir'd, much better than the *knots*. There be, who pretend an *art* of as fully *impregnating* the body of any living *Pine-tree*, for six, or eight foot high; and some have reported that such an *art* is practis'd in *Norway*: But upon several *experiments*, by *girdling* the *Tree* (as they call it) and cutting some of the *bark* round, and a little into the *wood* of the *Tree* six, or eight foot distant from the ground, it has yet never succeeded; whether the just *season* of the year were not observ'd, or what else omitted, were worth the *disquisition*; if at least there be any such *secret* amongst the *Norwegians*, *Swedes*, or any other *Nation*. Of *Tar*, by boiling it to a sufficient height, is *Pitch* made: and in some places where *Rosin* is plentiful, a fit proportion of *that*, may be dissolved in the *Tar* whiles it is boiling, and this *mixture* is soonest converted to *Pitch*; but it is of somewhat a differing *kind* from that which is made of *Tar* only, without other composition. There is a way which some *Ship-Carpenters* in those *Countries* have us'd, to bring their *Tar* into *Pitch* for any sudden use; by making the *Tar* so very hot in an *Iron Kettle*, that it will easily take *fire*, which when *blazing*; and set in an *airy* place, they let burn so long, till, by taking out some small quantity for trial, being *cold*, it appears of a sufficient *consistence*; Then by covering the *Kettle* close, the *fire* is extinguish'd, and the *Pitch* is made without more ceremony. There is a *process* of making *Rosin* also, out of the same *knots*, by splitting them out into thin pieces, and then boiling them in *water*, which will educe all the *Resinous* matter, and gather it into a *body*, which (when cold) will harden into pure *Rosin*. It is moreover to be understood, that the *Fir*, and most *Coniferous* *Trees*, yield the same *Concretes*, *Lachryme*, *Turpentine*, *Rosins*, *Hard*, *Naval* or *stone*, and *liquid Pitch*, and *Tar* for remedies against the *Cough*, *Arthritic* and *Pulmonic* affections; The *Chirurgion* uses it in *Plasters* also; and in a word, for *Mechanic* and other innumerable *uses*; and from the burning, and fuliginous vapour of these, especially the *Rosin*, we have our *Lamp*, and *Printers* black, &c. I am perswaded the *Pine*, and *Fir* trees in *Scotland*, might yield his *Majesty* plenty of excellent *Tar*, were some industrious Person employ'd about the work. But there is another *process* not much unlike the former, which is given us by the present *Archbishop of Samos*, *Joseph Georgirenes*, in his description of *that*, and other *Ilands* of the *Ægean*.

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Their

Their way of making *Pitch* (says he) is thus: They take *Sapines*, that is, that part of the *Fir*, so far as it hath no *knots*; and shaving away the extrem parts, leave only that which is nearest to the middle, and the *Pith*: That which remains, they call *Dadi* (from the old Greek word *Δαδης*, whence the Latine *Teda*) These they split into small pieces, and laying them on a *Furnace*, put fire to the upper part, till they are all burnt, the liquor in the mean time running from the *wood*, and let out from the bottom of the *Furnace*, into a hole made in the ground, where it continues like *Oyl*: Then they put *Fire* to't, and stir it about till it thickens, and has a consistence: After this, putting out the *Fire*, they cast *Chalk* upon it, and draw it out with a vessel, and lay it in little places cut out of the ground, where it receives both its form, and a firmer body for easie transportation: Thus far the *Archbishop*; but it is not so instructive, and methodical as what we have describ'd above.

C H A P. XXIII.

Of the Larch, Platanus, Lotus, Cornus, &c.

Larch.

If *Arix*, though of the *Coniferous* family, loses its leaf, (thrust off when the new comes) and therefore we separate him from the *Firs*, and *Pines*; I have rais'd it my self of *Seed*, and why we might not hope as well of the *Larch*, as from any of them, I know not: I read of *Beams* of no less than 120. foot in length, made out of this goodly Tree, which is of so strange a composition, that 'twill hardly burn; whence *Mantuan*, *Et robusta Larix igni impetrabile lignum*: for so *Cesar* found it in a *Castle* he besieg'd, built of it; (the story is recited at large by *Vitruvius* l. 2. c. 9.) but see what *Philander* says upon the place, on his own experience; yet the *Coal* thereof were held far better than any other, for the melting of *Iron*: and to say the truth, we find they burn it frequently as common fuel in the *Valdoline*, if at least it be the true *Larix*, which they now call *Melère*. There is abundance of this *Larch* timber in the *Buildings* at *Venice*, especially about the *Palaces* in *Piazza San Marco*, where I remember *Scmozzi* says he himself us'd much of it, and infinitely commends it. Nor did they only use it in *Houses*, but in *Naval Architecture* also: the *Ship* mention'd by *Witsen* (a late *Dutch* Writer of that useful *Art*) to have been found not long since in the *Namidian* Sea, twelve fathoms under water, being chiefly built of this *Timber*, and *Cypress*, both reduc'd to that induration and hardness, as greedily to resist the *fire*, and the sharpest tool; nor was any thing perished of it, though it had lain above a thousand, and four hundred years submerged: The *Decks* were cover'd with linnen, and plates of lead,

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fixed with nails gilt, and the intire *Ship* (which contain'd thirty foot in length) so stanch, as not one drop of water had soaked into any room. *Tiberius* we find built that famous *Bridge* to his *Nau-machia* with this *wood*, and it seems to excel for *Beams*, *Doors*, *Windows*, and *Masts* of *ships*, resists the *worm*; being driven into the ground, it is almost petrified, and will support an incredible Weight; which (and for its property of long reflecting fire) makes *Vitruvius* wish, they had greater plenty of it at *Rome* to make *Goists* of, where the *Forum* of *Augustus* was (it seems) built of it, and divers *Bridges* by *Tiberius*; for that being attempted with *Fire*, it is long in taking hold, growing only black without. From this *Tree* it is, that useful Drug *Agaric* is gathered; and the timber of it is so exceedingly transparant, that *Cabanes* made of the thin boards, when in the dark night, they have lighted candles, people, who are at a distance without doors, would imagine the whole room to be on fire, which is pretty odd, considering there is no material so unapt to kindle. The *Larix* bears polishing excellently well, and the *Turners* abroad much desire it: *Vitruvius* says 'tis so ponderous, that it will sink in the water. That which now grows some where about *Chelmsford* in *Essex*, arriv'd to a flourishing, and ample *Tree*, does sufficiently reproach our negligence, and want of industry, as well as the incomparable, and shady.

2. *Platanus*, that so beautiful, and precious *Tree*, so doated on *Platanus*, by *Xerxes*, that *Alian* and other *Authors* tell us he made halt, and stop'd his prodigious *Army* of seventeen hundred thousand *Souldiers*, which even cover'd the *Sea*, exhausted *Rivers*, and thrust Mount *Athos* from the *Continent*, to admire the pulchritude, and procerity of one of these goodly *Trees*, and became so fond of it, that spoiling both himself, his *Concubines*, and great Persons of all their jewels, he cover'd it with *Gold*, *Gemms*, *Neck-laces*, *Scarfs* and *Bracelets*, and infinite riches; In sum, was so enamor'd of it, that for some days, neither the concernment of his grand *Expedition*, nor interest of honour, nor the necessary motion of his portentous *Army*, could persuade him from it: He styl'd it his *Mistress*, his *Minion*, his *Goddes*; and when he was forc'd to part from it, he caus'd the figure of it to be stamp'd in a *Medail* of *Gold*, which he continually wore about him. Whereever they built their sumptuous, and magnificent *Colleges* for the exercise of Youth in *Gymnastics*, as *Riding*, *Shooting*, *Wrestling*, *Running*, &c. (like to our *French Academies*) and where the grayer *Philosophers* also met to converse together, and improve their *Studies*, betwixt the *Xista*, and *Subdiales ambulations* (which were *Porticos* open to the air) they planted *Groves*, and *Walks* of *Platanus*, to refresh, and shade the *Palæstrite*; as you have them describ'd by *Vitruvius*, lib. 5. cap. 11. and as *Claudius Perreault* has assisted the *Text*, with a *Figure*, or *Ichnographical* plot. These *Trees* the *Romans* first brought out of the *Levant*, and cultivated with so much industry and cost, for its stately and proud head only; that great *Orators*, and *States-men*, *Cicero*, and *Hortensius* would exchange

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now and then a *turn* at the *Bar*, that they might have the pleasure to step to their *Villas*, and refresh their *Platans*, which they would often irrigate with *Wine* instead of *Water*; and so priz'd the very shadow of it, that when afterwards they transplanted them into *France*, they exacted a *Tribute* of any of the *Natives*, who should presume but to put his *head* under it. *Pliny* tells us there is no *Tree* whatsoever which so well defends us from the heat of the *Sun* in *summer*; nor that admits it more kindly in *Winter*. And for our encouragement, I do upon experience assure you, that they will flourish, and abide with us, without any more trouble than frequent, and plentiful *Watering*, which from their youth, they excellently delight in, and gratefully acknowledge by their growth accordingly; so as I am perswaded, that with very ordinary Industry, they might be propagated to the incredible Ornament of the *Walks*, and *Avenues* to Great-mens houses. The Introduction of this true *Plane* amongst us, is due to that honourable Gentleman, *Sir Geo. Crook* of *Oxfordshire*, from whose bounty I received an hopeful plant now growing in my *Villa*.

3. There was lately at *Basle* in *Switzerland*, an ancient goodly *Platanetum*, and now in *France* they are come again in vogue: I know it was antiently accounted *ἀκρότατος*; but they may with us be rais'd of their seeds with care, in a moist soil, as here I have known them: But the reason of our little success, is, that we very rarely have them sent us ripe; which should be gather'd late in *Autumn*, and brought us from some more *Levantine* parts than *Italy*. They come also of *Layers* abundantly; affecting a fresh, and feeding ground; for so they plant them about their *Rivulets*, and *Fountains*. The *West-Indian Plane* is not altogether so rare, but it rises to a goodly *Tree*, and bears a very ample, and less jagged leaf: That the *Turks* use their *Platanus* for the building of *Ships*, I learn out of *Ricciolus Hydrol.* l. 10. c. 37.

Lotus.

4. The same opinion have I of the noble *Lotus Arbor*, (another lover of the *Water*) which in *Italy* yields both an admirable shade, and *Timber* immortal. Of this *Wood* are made *Pipes*, and *Wind-Instruments*, and of its *Root*, Hafts for *knives* and other *Tools*, &c. The offer of *Craffus* to *Domitius* for half a dozen of these *Trees*, growing about an house of his in *Rome*, testifies in what esteem they were had for their incomparable beauty and use. The *Cornel-tree*, though not mention'd by *Pliny* for its *Timber*, is exceedingly commended for its durability, and use in *Wheel-work*, *Pinnis*, and *Wedges*, in which it lasts like the hardest *Iron*; and it will grow with us to good bulk and stature; and the preserv'd, and pickl'd berries, are most refreshing, and an excellent condiment: But that is very odd, which *Matthioli* affirms upon his own experience, that one who has been bitten of a *Mad-dog*, if in a year after he handle the *Wood* of this *Tree* till it grow warm, relapses again into his distemper.

Cornus.

CHAP.

C H A P. XXIV.

Of the Cypress-tree, and Cedar.

Cypressus, the *Cypress-Tree*, is either the *Sative*, or *Garden tree*, *Cypress*, the most pyramidal and beautiful; or that which is call'd the *Male*, (though somewhat preposterously) which bears the *Cones*, but is of a more extravagant shape: should we reason only from our common experience, even the *Cypress-tree* was, but within a few years past, reputed so tender, and nice a *Plant*, that it was cultivated with the greatest care, and to be found only amongst the *Curious*; whereas we see it now, in every *Garden*, rising to as goodly a bulk and stature, as most which you shall find even in *Italy* it self; for such I remember to have once seen in his late *Majesties Gardens* at *Theobalds*, before that *Princely* seat was demolish'd. I say, if we did argue from this *Topic*, methinks it should rather encourage our *Country-men* to add yet to their *Plantations* other *Forreign*, and *useful Trees*, and not in the least deter them, because many of them are not as yet become *endenizon'd* amongst us.

2. We may read that the *Peach* was at first accounted so tender, and delicate a *Tree*, as that it was believ'd to thrive only in *Persia*; and even in the days of *Galen*, it grew no nearer then *Egypt*, of all the *Roman Provinces*, but was not seen in the *City*, till about thirty years before *Pliny's* time; whereas, there is now hardly a more common, and universal in *Europe*: Thus likewise, the *Avellana* from *Pontus* in *Asia*; Thence into *Greece*, and so *Italy*, to the *City* of *Abellino* in *Campania*.

Una tantum litera immutata, Avellina dicti, que prius Abellina.

I might affirm the same of our *Damascio Plum*, *Quince*, *Medlar*, *Figue*, and most ordinary *Pears*, as well as of several other *Peregrine Trees*, *Fruit-bearer*, and others; For even the very *Damask-rose* it self, (as my Lord *Bacon* tells us *Contr. 2. Exp. 659.*) is little more than an *hundred-years* old in *England*: Methinks this should be of wonderful incitement. It was 680 years after the foundation of *Rome*, ere *Italy* had tasted a *Cherry* of their own, which being then brought thither out of *Pontus* (as the above-mention'd *Filberts* were) did after 120 years, travel ad ultimos *Britannos*.

3. *Josephus* tells us, That the *Cedar* in *Judea* was first planted there by *Solomon*, who doubtless try'd many rare *Experiments* of this nature; and none more *Kingly* than that of *Planting* to *Posterity*. I do not speak of those which grow on the *Mountains* of *Libanus*, in the colder, and *Northern* tracts of *Syria*: But as I am inform'd by that curious *Traveller*, *Kanwolffius*, (since also confirm'd by that *Virtuoso* *Monsieur Monconys*) there remaining now not above twenty four of those stately *Trees*, in all those goodly *Forests*, where that mighty *Prince* set four score thousand *Hewers*

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at work for the *Materials* of one only *Temple* and a *Palace*, 'tis a pregnant *Example* what *Time*, and *Neglect* will bring to *ruine*, if due, and continual care be not taken to propagate *Timber*. We see almost the whole tract of *Apennines*, strip'd of the *Pines* and *Firs* (which formerly as *Pitruvius* testifies *L. 2. C. 10.* covered those *Mountains*) to that degree, as to render not only the *City* of *Florence*, but *Rome* herself so expos'd to the nipping *transmontane Winds* (as they call the *North*) that almost nothing which is rare, and curious, will grow without art and *hyemation*; so as even in most of those parts of *Italy* flanker'd by those *hills*, (and cover'd as now they perpetually are with *Snow*) they are fain to house their *Orange*, and other tender *Trees* as we do here in *England*.

4. Nor is it any wonder if we find the whole *Species* of some *Trees* so totally lost in a *Country*, as if there had never been any such planted in it; Be this therefore applied to *Fir*, *Pine*, and many others with us; since it was so long ere *Rome* was acquainted with them, or indeed with any of the *Pitch*-bearers we have mention'd.

5. We had out first *Amyrtils* out of *Greece*, and *Cypresses* from *Crete*, which was yet a meer stranger in *Italy*, as *Pliny* reports, and most difficult to be rais'd; which made *Cato* to write more concerning the *culture* of it, than of any other *Tree*: Notwithstanding we have in this *Country* of ours, no less than three sorts, which are all of them easily propagated, and prosper very well, if they are rightly ordered; and therefore I shall not omit to disclose one *secret*, as well to confute a popular *Errour*, as for the *Instruction* of our *Gard'ners*.

6. The *Tradition* is, That the *Cypress* (being a *Symbol* of *Mortality*, they should say of the contrary) is never to be cut, for fear of *killing* it. This makes them to *impale*, and *wind* them about, like so many *Egyptian Mummies*; by which means, the inward parts of the *Tree* being heated, for want of *Air* and *Refreshment*, it never arrives to any perfection, but is exceedingly troublesome, and chargeable to maintain; whereas indeed, there is not a more *sonfise*, and governable *Plant* in nature; For the *Cypress* may be cut to the very *Roots*, and yet spring afresh: And this we find was the *husbandry* in the *Isle* of *Zanaria*, where they us'd to fell it for *Coppice*: For the *Cypress* being rais'd from the *Nursery* of *Seeds* sown in *September* (or rather *March*;) and within two years after *transplanted*, should at two years standing more, have the *master*-item of the *middle* shaft cut off some hand-breadth below the *Summit*, the *sides*, and smaller sprigs thorn into a *conique*, or *pyramidal* form, and so kept *clipp'd* from *April* to *September*, as oft as there is occasion; and by this *Regiment*, they will grow *furnish'd* to the *foot*, and become the most beautiful *Trees* in the world, without *binding* or *stake*; still remembering to abate the *middle* item, and to bring up the *collateral* branches in its stead to what altitude you please; but when I speak of *shortning* the *middle shoot*, I do not intend the *dwarfing* of it, and therefore it must be done discreetly, so as it may not over-hastily advance, till the *foot* thereof be perfectly furnished: But there is likewise another, no less commendable expedient, to dress

dress this *Tree* with all the former advantages; if sparing the *shaft* altogether, you diligently cut away all the *forked branches*, reserving only such as radiate directly from the *body*, which being thorn, and clipp'd in due season, will render the *Tree* very beautiful; and though more subject to obey the shaking *winds*, yet the natural *spring* of it, does immediately redress it, without the least *discomposure*; and this is a *secret* worth the learning of *Gard'ners*, who subject themselves to the trouble of *stakes*, and *binding*, which is very inconvenient. Thus likewise may you form them into *Hedges*, and *Topiary* works, or by sowing the *Seeds* in a shallow *furrow*, and plucking up the *Supernumeraries* where they come too close and thick: For in this *work*, it will suffice to leave them within a foot of each other; and when they are risen about a yard in height (which may be to the half of your *Palisado*) cut off their *tops*, as you are taught, and keep the *sides* *clipp'd*; that they ascend but by degrees, and thicken at the bottom as they climb. Thus, they will present you (in half a dozen or eight years) with incomparable *Hedges*, preferable to all others whatsoever, because they are perpetually green, and able to resist the *Winds* better than any which I know, the *Holly* only excepted, which indeed has no peer.

7. When I say *Winds*, I mean their fiercest *gusts*, not their *cold*: For though it be said, *Brumâque ille sa Cupressus*, and that indeed no *frost* impeaches them (for they grow even on the *snowy tops* of *Ida*;) yet our cruel *Eastern* winds do sometimes mortally invade them which have been late *clipp'd*, seldom the untouch'd, or that were *dressed* in the *Spring* only: The effects of the late *March*, and *April* *Winds* (in the years 1663. and 1665.) accompanied with cruel *Frosts*, and cold *blasts*, for the space of more than two months night and day, did not amongst near a thousand *Cypresses* (growing in my *Garden*) kill above three or four, which for being very late cut to the *quick* (that is, the latter end of *October*;) were raw of their *wounds*, took cold, and *gangreen'd*; some few others which were a little smitten towards the *tops*, might have escap'd all their blemishes, had my *Gard'ner* capp'd them but with a *wisp* of *hay* or *straw*, as in my absence, I commanded. As for the *frost* of those *Winters* (than which I believe there was never known a more cruel and deadly piercing since *England* had a name) it did not touch a *Cypress* of mine, till it join'd forces with that destructive *Wind*: Therefore for *caution*, clip not your *Cypresses* late in *Autumn*, and cloath them (if young) against these *winds*; for the *frosts* they only *discolour* them, but seldom, or never hurt them, as by long experience I have found.

8. If you affect to see your *Cypress* in *standard*, and grow wild (which may in time come to be of a large substance, fit for the most immortal of *Timber*, and indeed are the least obnoxious to the rigours of our *Winters*, provided you never *clip*, or *disbranch* them) plant of the reputed *Male* sort; it is a *Tree* which will prosper wonderfully; and where the ground is *hot*, and *gravelly*, though (as we said) he be nothing so beautiful;

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and it is of *this*, that the *Venetians* make their greatest profit.

9. There is likewise the *Tarentine Cypress*, so much celebrated by *Cato*; I do not mean our *Savine*, (which some erroneously take for it, though there be a *Berry-bearing Savine*, much resembling the *Cypress*, which comes to prove a gallant, upright *Tree*, fit for the *Standard*.) Both *that*, and the *Milestan*, are worthy our culture.

10. I have already shew'd how this *Tree* is to be rais'd from the *seed*; but there was another *Method* amongst the *Antients*, who (as I told you) were wont to make great *Plantations* of them for their *Timber*: I have practis'd it my self, and therefore describe it.

11. If you receive your *seed* in the *Nuts*, which uses to be gather'd *thrice* a year, (but seldom ripening with us) expose them to the *Sun* till they *gape*, or near a gentle *fire*, or put them in *warm water*, by which means the *seeds* will be easily shaken out; for if you have them open before, they do not yield you half their crop. About the beginning of *April* (or before, if the weather be *showery*) prepare an even *Bed*, which being made of fine *earth*, clap down with your *Spade*, as *Gard'ners* do for *Purslain*-seed (of old they roll'd it with some *Stone*, or *Cylinder*) Upon this strew your *seeds* pretty thick; then sift over them some more *mould*, somewhat better than half an *inch* in height: keep them duly *watered* after *Sun-set*, unless the season do it for you; and after one *year's* growth (for they will be an *inch* high in little more than a *Month*) you may *transplant* them where you please. In watering them, I give you this *caution*. (which may also serve you for most tender, and delicate *seeds*.) that you *dew* them rather with a *broom*, or *Spergitor*, than hazard the beating them out with the common *watering-pot*; and when they are well come up, be but sparing of *water*: Be sure likewise that you cleanse them when the *weeds* are very young and tender, lest in stead of *purging*, you quite eradicate your *Cypresses*. We have spoken of *Watering*, and indeed whilst young, if well follow'd, they will make a prodigious advance: when that long, and incomparable walk of *Cypress* at *Frascati* near *Rome*, was first planted, they drew a small stream (and indeed *Irrigare* is properly thus, *aquam inducere rigatis* (i. e.) in small *gutters* and *nills*) by the foot of it, (as the *Water* there is in abundance tractable) and made it (as I was credibly inform'd) arrive to seven, or eight foot height in one year; but with us, we may not be too prodigal; since, being once well taken, they thrive best in our sandy, light, and warmest grounds, whence *Cardan* says, *juxta aquas arefcit*, meaning in low, and moorish places, stiff, and cold earth, &c. where they never thrive.

12. What the *Uses* of this *Timber* are, for *Chests*, and other *Vessels*, Harps, and divers other *Musical Instruments* (it being a very sonorous wood, and therefore employ'd for *Organ-pipes*, as heretofore for *supporters* of *Vines*, *Poles*, *Rails*, and *Planks*, (resisting the *Worm*, *Moth*, and all putrefaction to eternity) the *Venetians* sufficiently understand; who did every *twenty* year, and oft-

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ner (the *Romans* every *thirteen*) make a considerable *Revenue* of it out of *Candy*: And certainly, a very gainful *commodity* it was, when the *Fell* of a *Cupressetum*, was heretofore reputed a good *Daughters Portion*, and the *Plantation* it self call'd *Dotem filia*. But there was in *Candy* a vast *Wood* of these *Trees*, belonging to the *Republicque*, by malice, or accident (or perhaps by *solar* heat, as were many *woods* 74 years after, even here in *England*) set on *Fire*, which *Anno* 1400. burning for seven years continually, before it could be quite extinguish'd, fed so long a space by the *un-usuall* nature of the *Timber*, of which there were to be seen at *Venice* planks of above four foot in breadth; and formerly the *Valves* of *St. Peters Church* at *Rome*, were fram'd of this *Material*, which lasted from the great *Constantine*, to *Pope Eugenius* the *Fourth* time, almost six hundred years; and then were found as fresh, and intire as if they had been new: But this *Pope* would needs change them for *Gates* of *Brass*, which were cast by the famous *Antonio Philarete*; not in my opinion so *venerable*, as those of *Cypress*. It was in *Coffins* of this material, that *Thucydides* tells us, the *Athenians* us'd to bury their *Heroes*, and the *Mummy*-*Chests* brought with those *Condidit bodies* out of *Egypt*, are many of them of this material, which 'tis probable may have lain in those dry, and sandy *Crypta*, many *thousand* years.

13. The *Timber* of this wood was of infinite esteem with the *Antients*: That lasting *Bridge* built over the *Euphrates* by *Semiramis*, was made of this wood; and it is reported, *Plato* chose it to Write his *Laws* in, before *Brass* it self, for the *dinurnity* of the matter: It is certain, that it never *rists* or *cleaves*, but with great violence; and the *bitterness* of its juice, preserves it from all *Worms*, and putrefaction. To this day those of *Crete*, and *Malta* make use of it for their *Buildings*; because they have it in plenty, and there is nothing out-lasts it, or can be more beautiful, especially, than the *Root* of the wilder sort, incomparable for its *crisped undulations*. Divers *Learned Persons* have conceiv'd the *Gopher* mention'd in holy *Writ*, *Gen. 6. 14.* and of which the *Ark* was built, to have been no other than this *Kumeloxos*, *Cypar*, or *Cuper*, by the easie mutation of Letters; *Aben Ezra* names it a *light wood* apt to swim; so does *David Kimchi*; which rather seems to agree with *Fir* or *Pine*, and such as the *Greeks* call *ξύλα τετραγωνα* quadrangular *Trees*, about which *Critics* have made a deal of stir: But *Isa. Vossius* (on the *LXX. c. 11.*) has sufficiently made it out, that the *Timber* of that denomination was of those sort of *Trees* whose *Branches* breaking out just opposite to one another at right *Angles*, make it appear to have been *Fir*, or some sort of wood whose *Arms* grew in an uniform manner; but surely this is not to be universally taken; since we find *Tew*, and divers other trees, brittle, heavy, and unapt for *Shipping* do often put forth in that order: The same learned *Author* will have *Gopher* to signify only *Pitch*, or *Bitumen*, as much as if the *Text* had said, Make an *Ark* of resinous *Timber*. The *Chalde* paraphrase translates it *Cedar*, or as *Junius* and *Tremellius*, *Cedrelaten*, a species between *Fir* and

Cedar: Munster contends for the *Pine*, and divers able Divines endeavour to prove it *Cypress*; and beside, 'tis known, that in *Crete* they employ'd it for the same use in the largest contignations, and did formerly build *ships* of it: And *Epiphanius* Heref. l. 1. tells us, some *Reliques* of that *Ark* (circa Campos Sennaar) lasted even to his days, and was judged to have been of *Cypress*. Some indeed suppose that *Gopher* was the Name of a place à *Cupressis*, as *Elon* à *Quercubus*; and might possibly be that which *Strabo* calls *Cupressetum*, near *Adiabene* in *Assyria*: But for the reason of its long lasting, *Coffins* (as noted) for the dead were made of it, and thence it first became to be *Diti Sacra*; and the *Valves*, or *Doors* of the *Ephesine* Temple were likewise of it, as we observ'd but now were those of *St. Peters* at *Rome*: Works of *Cypress-wood*, permanent ad diuturnitatem, says *Vitruvius* l. 2. and the Poet

—perpetua nunquam moritura Cupresso.

Mar. E. 6. 6.

But to resume the disquisition, whether it be truly so proper for *Shipping*, is controverted, though we also find in *Cassiodorus Var. l. 5. Ep. 16. Theodorice* (writing to the *Prætorio-præfatus*) caused store of it to be provided for that purpose; and *Plato* (who we told you made *Laws*, and *Titles* to be Engraven in it) nominates it inter *Arbores navesis utilis*, l. 4. leg. and so does *Diodorus* l. 19. And as *Travellers* observe, there is no other sort of *Timber* more fit for *Shipping*, though others think it too heavy: *Aristobolus* affirms, that the *Assyrians* made all their *Vessels* of it; and indeed the *Romans* prais'd it, pitch'd with *Arabian Pitch*: and so frequent was this *Tree* about those parts of *Assyria* (where the *Ark* is conjectur'd to have been built) that those vast *Armadas*, which *Alexander the Great* caus'd to be Equipp'd and set out from *Babylon*, consisted only of *Cypress*, as we learn out of *Arrian* in *Alex. l. 7.* and *Strabo* l. 16. *Plutar. Sympol. l. 1. Prob. 2. Vegetius l. 4. c. 34. &c. Paulus Colanenus* (in his *republica literaria* cap. 24.) perstringes the most Learned *J. Vossius*, that in his *Vindicia pro LXX. Interp.* he affirms *Cypress* not fit for *Ships* as being none of the *navisgigni*: But besides what we have produc'd, *Fuller, Bochartus, &c. Lilius Gyraldus* (*lib. de Navig. c. 4.*) and divers others, sufficiently evince it, and that the *Vessel* built by *Trajan* was of that material, lasting uncorrupt near 1400 years, when it was afterwards found in a certain *Lake*; if it were not rather (as I suspect) that which *Aneas Silvius* reports to have been discovered in his time, lying under *Water* in the *Numician Lake*, crufted over with a certain ferruginous mixture of *Earth* and *Scales*, as if it had been of *Iron*; but (as we have elsewhere noted) it was pronounc'd to be *Larix*, and not *Cypress*, employ'd by *Tiberius*: Finally (not to forget even the very chips of this precious wood, which give that flavour to *Muscadines*, and other rich *Wines*) I commend it for the improvement of the *Air*, and a *specific* for the *Lungs*, as sending forth most sweet, and *aromatick* emissions, when ever it is either

clipp'd,

clipp'd, or handled, and the chips, or cones being burnt, extinguishes *Moths*, and expells the *Gnats* and *Flies*, &c. not omitting the *Gum* which it yields, not much inferior to the *Terbinthine*, or *Lentisc*. But,

Quid tibi odorato referam sudantia ligno,

if I forget

14. The *Cedar*? which grows in all extreams: In the moist *Barbados*, the hot *Bermudas*, the cold *New-England*; even where the *Snow* lyes (as I am assur'd) almost half the year; (for so it does on *Mount Libanus*, from whence I have receiv'd seed of those few remaining *Trees*) Why then it should not thrive in *Old England*, I conceive is from our want of *Industry*: It grows in the *Bogs* of *America*, and in the *Mountains* of *Asia*; it seems there is no place affrights it; I have frequently rais'd it of the *Seeds*, which I set like the *Bay-berries*; and we might have of the very best kind in the *World*, from the *Summer Islands*, though now almost utterly exhausted there also, and so the most incomparable of that sacred wood, like to be quite destroy'd by our negligence, which is by nature almost eternal: But that which we have from *Barbados* and *Jamaica*, is a spurious sort, and of so porous a nature, as that *Wine* will soak through it; yet that which they so call in *New-England*, is a lofty grower, which being saw'd into *Planks* makes excellent *flooring*, and everlasting: They *Shingle* their houses with it, and use it in all their edifices: why have we not more of these *Species* brought over amongst us both to plant, and work out? In the meantime, 'tis the *Oxycedrus* of *Lycia*, which the *Architect Astrucius* describes to have its leaves resembling *Cypress*; the right *Phœnician Cedar* has them like the *Juniper*, and it bears a *Cone* not so pointed, and distinct in *Scales*, as I have seen them from *Mount Libanus* it self.

15. Thus I read that in the *Temple of Apollo at Utica*, there was found *Timber* of near two thousand years old; and in *Sagunt* of *Spain*, a Beam in a certain *Oratory* consecrated to *Diana*, which had been brought from *Zant* two hundred years before the Destruction of *Troy*: The *Statue* of that *Goddeſs* in the famous *Ephesine Temple*, was of this material also, as was most of the *Timber-work* in all their sacred Edifices.

16. And here I cannot omit my *Wishes*, that since this precious material may be had at such tolerable rates (as certainly it might from *Cape-Florida*, the *Bermudas*, and other parts of the *West Indies*) I say, I cannot but suggest that our more Wealthy *Citizens* of *London*, now Building, might be encourag'd to use of it in their *Shops*; at least for *Shelves*, *Comptoirs*, *Chests*, *Tables*, *Wainscot*, &c. It might be done with moderate Expence, especially, in some small proportions, and in *Faneering*, as they term it, and mouldings, since beside the everlastingness of the wood, not obnoxious to the *Worms*, and which would also be a means to preserve cloth, and other *Ware* from *Moths* and *corruption*; it would likewise be a Cure, to reform the Malignity, and corrosiveness of the *Air*, and even preserve the whole *City*, as if it stood amongst the *Spices* of the

Cedar,

the happy *Arabia*, or the prospects of *Mount Libanus*. Note, that the *Cedar* is of so dry a nature, that it will not well endure to be fastned with *Nails*, from which it usually shrinks, and therefore *Pinns* of the same wood, are better. But what should we say of their building huge *ships*, and other lesser *Vessels* with this material? 'tis reported that *Sesostris* (that antient King of *Egypt*;) built one of 280 cubits, all gilded without and within.

17. The *Sittim* mention'd in holy *Writ*, is believ'd to have been a kind of *Cedar*, of which the most precious *Vienfils* were formed; so that when they said a thing was *cedro digna*, the meaning was, *worthy of eternity*.

C H A P. XXV.

Of the Cork, Ilex, Alaternus, Phyllyrea, Granada, Lentisc, Olive, Myrtle, Jasmine, &c.

Cork.

1. **T**HE Cork [*suber*] of which there are two sorts (and divers more in the *Indias*) one of a narrower, less jagged leaf and *perennial*; the other of a broader, falling in *Winter*; grows in the coldest parts of *Biscany*, in the North of *New-England*, in the South-West of *France*, especially the second Species, fittest for our Climate; and in all sorts of ground, dry *Heaths*, *Stony*, and *Rockie-Mountains*, so as the Roots will run even above the Earth where they have little to cover them; all which considered, methinks we should not despair: We have said where they grow plentifully in *France*; but by *Pliny*, *Nat. Hist. l. 16. c. 8.* it should seem they were since transplanted thither; for he affirms there were none either there, or in *Italy*, in his time: But I exceedingly wonder that *Carolus Stephanus*, and *Cursus* should write so peremptorily, that there were none in *Italy*, where I myself have travell'd through vast Woods of them about *Pisa*, *Aquino*, and in divers tracts between *Rome* and the Kingdom of *Naples*. The Spanish Cork is a species of the *Enzina*, differing chiefly in the Leaf, which is not so prickly; and in the Bark, which is frequently four or five inches thick: The manner of decortication thereof is once in two, or three years to strip it in a dry season; otherwise, the intercutaneous moisture indangers the Tree, and therefore a rainy-season is very pernicious; when the bark is off, they unwarp it before the fire, and press it even, and that with weights upon the convex part, and so it continues being cold.

2. The uses of Cork is well known amongst us both at Sea and Land, for its resisting both Water, and Air: The *Fisher-men* who deal in *Nets*, and all who deal with *Liquors*, cannot be without it: Antient Persons prefer it before *Leather* for the soles of their shoes,

Shoes, being light, dry, and resisting moisture, whence the *German*s name it *Pantoffel-holz* (Slipper-wood) perhaps from the *Greek* *Παῖδος* & *ξύλον*; for I find it first applied to that purpose by the *Grecian* Ladies, whence they were call'd *light-footed*; I know not whether the *Epithete* do still belong to that Sex; but from thence it's likely the *Venetian* Dames took it up for their monstrous *Choppines*; affecting, or usurping an artificial eminency above *Men*, which Nature has denied them. Of one of the sorts of Cork are made pretty *Cups*, and other *Vessels*, esteem'd good to drink out of for *Hedical* persons: The *Egyptians* made their *Coffins* of it, which being lin'd with a resinous composition, preserv'd their Dead incorrupt: The poor People in *Spain*, lay broad Planks of it by their Beds-side, to tread on (as great Persons use *Turkie*, and *Persian* Carpets) to defend them from the floor, and sometimes they line, or *Wainscot* the Walls, and inside of their Houses built of Stone, with this Bark, which renders them very warm, and corrects the moisture of the Air: Also they employ it for *Bee-Hives*, and to double the insides of their *Contempliers*, and leather Cases, wherein they put *Flasquera's* with Snow to refrigerate their Wine. This Tree has beneath the Cortex or Cork, two other Coats, or *Libri*, of which one is reddish, which they strip from the bole when 'tis sell'd only; and this bears good price with the Tanner: The rest of the wood is very good firing, and applicable to many other uses of Building, Palisade-work, &c. The *Alpes* drunk stops the Bloody-flux.

3. *Ilex major glandifera* or great Scarlet-Oak, (a devoted Tree *Ilex* of old, and therefore *incedna*) thrives manifestly with us; witness His Majesty's Priory Garden at *White-Hall*, where once flourish'd a goodly Tree, of more than four score years growth, and there was lately a sickly Impe of it remaining.

4. By what I have touch'd in the Chapter of the *Elms*, concerning the peregrination of that Tree into *Spain* (where even in *Pliny's* time there were none, and where now they are in great abundance) why should we not more generally endeavour to propagate the *Ilex* amongst us; I mean, that *Baccifera*, which the *Spaniards* call the *Enzina*, and of which they have such Woods, and profitable Plantations? They are an hardy sort of Tree, and familiarly rais'd from the *Acorn*, if we could have them found, and well put-up in Earth or Sand, as I have found by experience.

5. The wood of these *Ilex's* is serviceable for many uses, as *Sticks* of Tools, Mallet-heads, Mallet-balls, Chairs, Axletrees, Wedges, Beetles, Pins, and above all, for Palisades us'd in Fortifications. Besides it affords so good fuel, that it supplies all *Spain* almost with the best, and most lasting of Charcoales, in vast abundance. Of the first kind is made the Painters Lac, extracted from the berries; to speak nothing of that noble Confection *Alkermes*: The *Acorns* of the first yield excellent nourishment for *Rustics*, sweet, and little, if at all, inferior to the *Chestnuts*; and *this*, and not the *Fagus*, was doubtless the true *Esculus* of the *Antients*, the Food of the Golden age. The wood of the *Enzina* when old, is curiously chambleted,

ted, and embrodered with Natural *vermiculations*, as if it were painted. Note, that the *Kermes* Tree does not always produce the *Coccum*, but near the *Sea*, and where it is very hot; nor indeed when once it comes to bear *Acorns*, and therefore the people do often burn down the old Trees, that they may put forth fresh branches, upon which they find them.

Alaternus. 6. The *Alaternus*, which we have lately receiv'd from the hottest parts of *Languedoc* (and that is equal with the heat of almost any Country in Europe) thrives with us in *England*, as if it were an *Indigene* and *Natural*.

7. I have had the honour to be the first who brought it into Use, and reputation in this Kingdom for the most beautiful, and useful of *Hedges*, and *Verdure* in the world (the *swiftness* of the growth consider'd) and propagated it from *Cornwall*, even to *Cumberland*: The seed grows ripe with us in *August*; and the hony-breathing *blossoms* afford an early, and marvellous relief to the *Bees*.

Phillyrea. 8. All the *Phillyrea's* (of which are five or six sorts) are yet more hardy; which makes me wonder to find the *Angustifolia* planted in *Cases*, and so charily set into the *Stoves*, amongst the *Oranges* and *Lemmons*; when by long experience, I have found it equal our *Holly*, in suffering the extremest rigours of our cruellest *Frosts*, and *Winds*, which is doubtless (of all our *Engliss* Trees) the most insensible and stout.

9. They are (both *Alaternus*, and *this*) rais'd of the *Seeds* (though those of the *Phillyrea* will be long under ground) and being transplanted for *Espalier* hedges, or *Standards*, are to be govern'd by the *Shears*, as oft as there is occasion: The *Alaternus* will be up in one Month after it is sown: Plant it out at two years growth, and clip it after rain in the *Spring*, before it grows sticky, and whiles the shoots are tender; thus will it form an *hedge* (though planted but in single rows, and at two foot distance) of a yard in thickness, twenty foot high (if you desire it) and furnish'd to the bottom: But for an hedge of this altitude, it would require the friendship of some *Wall*, or a *Frame* of lusty *Poles*, to secure against the *Winds* one of the most delicious objects in nature: But if we could have store of the *Phillyrea folio leviter serrato* (of which I have rais'd some very fine Plants from the *Seeds*) we might fear no weather, and the verdure is incomparable, and all of them *tosile*.

Granade. 10. The Culture of the *Granade* (of which are three sorts) does little differ from that of the *Alaternus*, of which we might raise considerable *Hedges* on all our Southern Aspects: They have supported that most unmerciful Winter in sixty three, without any artifice; and if they yield us their flowers for our pains of well pruning and Recision (for they must diligently be purged of their wood) it is a glorious recompence: I plant them in my *Hedge-rows*, even amongst the *Quick*; but to have them thrive, you must loosen the Earth at *Roots*, and enrich it both *Spring* and *Autumn*, leaving but a few woody branches: There is no Tree so *Adulterous* as this *Shrub*, and best by *Layers*, *Approach*, and *Inarching*,

as

as they call it; and thence 'tis said to marry with *Lawrels*, *Damson*, *Ash*, *Almond*, *Mulberry*, *Citron*, &c. too many (I fear) to hold: If you will plant them in *Gardens* to best advantage, keep them to one *Stem*, and enrich the mould with *Hogs dung* well consum'd, which they greatly delight in: Plant it in a warm corner to have *Flowers*; they also sometimes knit into small *Fruit*, but then the *Shrub* must be treated like the *Orange* during the *Winter*.

11. The vulgar Italian wild *Myrtil* (though not indeed the most fragrant) grows high, and supports all weathers. I know of one near fifty years old, which has been continually expos'd; unless it be, that in some exceeding sharp Seasons, a little dry straw has been thrown upon it; and where they are smitten, being cut down near the ground, they put forth, and recover again; which many times they do not in *Pots*, and *Cases*, where the *Roots* are very obnoxious to perish with mouldiness. The shelter of a few Mats, and straw, secur'd very great Trees (both leaf and colour in perfection) this last Winter also, which were planted abroad; whiles, those that were carried into the *Conserves*, were most of them lost. *Myrtils* (which are of six, or eight sorts) may be rais'd of *Seeds*, but with great caution; and they seldom prove hardy, nor is it worth the time, being so abundantly encreas'd of *Layers*: You cannot give these *Shrubs* too much compost, or refreshing. Both *Leaves*, and *Berries* refrigerate, and are very astringent and drying, and therefore seldom us'd within, except in Fluxes: with *Wine*, and *Hony* it heals the noysome *Polypus*, and the powder corrects the rankness of the *Arm-pits*, and *Gonnet* as the French term it, to which divers of the Female sex are subject: The *Berries* mitigate the Inflammations of the *Eyes*, consolidate broken bones; and there is an excellent sweet-water distill'd from the leaves and flowers, &c.

12. *Lentiscus*, the *Lentisc*, a very beautiful ever-green, will thrive abroad with us, with a little care and shelter, amongst other expos'd *Shrubs*, and may be propagated of *Suckers*, and *Layers*; and the like may be done by the *Olive*, though it bear no other *Olive*. *Fruit* than the perennial verdure of the leaves: Of the *Lentisc* are made the best *Tooth-pickers* in the world, and the *Mastic*, or *Gum* is of excellent use, especially for the *Teeth* and *Gums*.

13. I might to these add *Lignum vite*, or *Arbor Thuya*, which *Thuya* grows of every Layer, to a very tall, straight, goodly Tree, hardy in all seasons; the wood incomparable for the *Turner* of *Boxes*, *Bowls*, *Cups*, and other curiosities, and the leaf smelling like *Oyniment*, makes one of the best for green Wounds, suddenly closing them; so as I wonder we plant it not frequently; the *Ethiopic Seseli*, *Halimus Latifolius*, *Laurus Tinus*, *Celastrus*, &c. fittest for the *Shrubby* part, and under-furniture of our Ever-green-Groves, and near our *Gardens* of Pleasure. To these we might add (not for their green) the more rare *Exotics*, *Styrax Arbor*, and *Terebynth*, noting by the way, that we have no true *Turpentine* to be bought in our Shops; but what is from the *Larch*; whilst *Apothecaries*

S

carries

carries substitute that which extills from the *Fir-tree*, instead of it: But

14. I produce not these *particulars*, and other *amœna vireta* already mention'd, as signifying any thing to *Timber*, the main design of this *Treatise* (though I read of some *Myrtils* so tall, as to make *spear-shafts*) but to exemplify in what may be farther added to *Ornament* and *Pleasure*, by a cheap, and most agreeable *industry*. The *Berries* of *Myrtil* were us'd of old in stead of *Peper*, and in some places they dress *Leather* with the *leaves*.

Jasmine.

15. The common *white*, and *yellow Jasmine* would flower plentifully in our *Woods*, and as hardy as any of the *Periclimena*: How it is propagated by *submersion*, or *layers*, every *Gardner* skills; and if it were as much employ'd for *Nose-gays*, &c. with us, as it is in *France* and *Italy*, they might make *money* enough of the *Flowers*: One sorry Tree in *Paris*, where they abound, has been worth to a poor *Woman* near *twenty shillings* in a year.

C H A P. XXVI.

Of the *Acacia*, *Arbutus*, *Bays*, *Box*, *Yew*, *Holly*, *Juniper*, and *Laurel-trees*.

Acacia.

1. THE *French* have lately brought in the *Virginian Acacia*, which exceedingly adorns their *Walks*: The Tree is hardly against all the invasions of our sharpest seasons, but our high *Winds*; which by reason of its brittle nature, it does not so well resist; and the *Roots* (which insinuate, and run like *liquorize* under ground) are apt to *emaciate* the *Soil*, and therefore haply not so commendable in our *Gardens*, as they would be agreeable for variety of *Walks* and shade: They thrive well in his *Majesties* new *Plantation* in *St. James's Park*.

Arbutus.

2. But why do we thus neglect the *Arbutus*, and make that such a *rarity*, which grows so common, and so naturally in *Ireland*? It is indeed with some difficulty rais'd from the *Seeds*; but it may be propagated from the *Layers*, grows to a goodly Tree; is patient of our *climat* unless it be very severe Weather, and may be contriv'd into most beautiful *Hedges*: 'tis said this Tree grows to a vast bulk and altitude in *Mount Athos*, and other Countries: *Virgil* reports it will *inoculate* with the *Nut*; and I find *Baubinus* commends the *Coals* for *Goldsmiths* works, and the *Poet*

Arbutus Barrows and the mystic Van.

Arbutus crates, & mystica Vannus Iacchi.

Georg. 1.

Bays.

3. *Laurus Vulgaris*, *Bays*, are increas'd both of their *Suckers*, and *Seeds* or *Berries*, which should be dropping-ripe ere gather'd:

Pliny

Pliny has a particular *process* for the ordering of the *Seeds*, and it is not to be rejected: Which is, the gathering the *Berries* in *January*, and spreading them till their sweat be over; then he puts them in *dung* and sows them: As for the steeping in *Wine*, *Water* does altogether as well; others wash the *seeds* from their *mucilage*, by breaking, and bruising the glutinous *berries*; then sow them in *March* by scores in a heap; and indeed for they will come up in *clusters*, but nothing so well, nor fit for *transplantation*, as where they are *interr'd* with a competent scattering, so as you would furrow *Pease*: Both this way, and by letting them apart (which I most commend) I have rais'd multitudes, and that in the *Berries*, without any farther *preparation*; only for the first two years, they would be defended from the piercing *winds*, which frequently destroy them; and yet the scorching of their tender *leaves* ought not make you despair, for many of them will recover beyond expectation.

4. This *aromatic* Tree greatly loves the *Shade*, yet thrives best in our hottest *gravel*, having once pass'd those first difficulties: *Age*, and *Culture* about the *Roots* wonderfully augment its growth; so as I have seen *Trees* near thirty foot high of them; and almost two foot *diameter*. They are fit also both for *Arbour*, and *Palisade-work*, so the *Gardner* understand when to prune, and keep it from growing too *woody*. The *Berries* are *emollient*, sovereign in affections of the *Nerves*, *Colics*, *Gargarism*, *Baths*, *Salves*, *Perfumes*, and some have us'd the leaves instead of *Cloves*.

5. *Buxus*, the *Box*, which we begin to *proscribe* our *Gardens* *Box*. (and indeed *Bees* are no friend to it) should not yet be banish'd from our care; because the excellency of the *Wood*, does commute for the unagreeableness of its smell: therefore let us furnish our cold, and barren *Hills*, and declivities with this useful *shrub*, I mean the taller sort, for I meddle not here with the *dwarf* and more *touffe*: It will increase abundantly of *Slips* set in *March*, and towards *Bartholmew-tide*.

6. The *Turner*, *Ingraver*, *Carver*, *Mathematical-Instrument*, *Comb*, and *Pipe-makers* (*Si buxos insulare juvat—Virg.*) give great prices for it by *weights*, as well as measure; and by the *seasoning*, and divers manner of *cutting*, vigorous *insolations*, *politure* and *grinding*, the *Roots* of this Tree (as of even our common, and neglected *Thorn*) do furnish the *Wulayer*, and *Cabinet-makers* with pieces rarely *undulated*, and full of variety. Also of *Box* are made *Wheels* or *Shivers* (as our *Ship-Carpenters* call them) and *Pins* for *Blocks* and *Pullies*; *Pegs*, for *Musical Instruments*; *Nut-crackers*, *Weavers-Shuttles*, *Hollar-sticks*, *Bump-sticks*, and *Dressers* for the *Shoo-maker*, *Rulers*, *Rolling-pins*, *Pestles*, *Mall-balls*, *Beetles*, *Toppi*, *Tables*, *Chefs-men*, *Screws* male, and female, *Bobins* for *Bone-lace*, *Spoons*, nay the stoutest *Axle-trees*; but above all,

Box-Creeds bear no small part
In the *Militia* of the Female Art;
Tow' tye the *Lings* which hold our Gallants fast,
And spread the *Nets* to which fond *Lovers* haist.

Non ultima belli
Arma Pullaris; Laqueos haec uestit Auantium,
Et venatrix disponit retia Forma.

Coullii Pl. l. 6.

7. The *Chymical* oyl of this *wood* has done the feats of the best *Gujacum* (though in greater quantity) for the Cure of *Venereal* Discaies, as one of the most expert *Physicians* in *Europe* has confel'd. The oyl asswages the *Tooth-ach*.

8. Since the use of *Bows* is laid aside amongst us, the propagation of the *Yew-tree* (of which we have two sorts, and other places reckon more, as the *Arcadian* black, and red; the yellow of *Ida*, infinitely esteem'd of old) is likewise quite forborn; but the neglect of it is to be deplor'd; seeing that (besides the rarity of it in *Italy*, and *France*, where but little of it grows) the barrenest grounds, and coldest of our Mountains (for

— *Aquilone & frigora taxi*) might be profitably replenish'd with them: I say, profitably, for, besides the use of the wood for *Bows*

— *Ilyraos taxi torquentur in arcus*. (for which the close, and more deeply dy'd is best) the foremention'd *Artists* in *Box* most gladly employ it: And for the *Cogs* of *Mills*, *Pests*, to be set in moist grounds, and everlasting *Axle-trees*, there is none to be compar'd with it; likewise for the bodies of *Lutes*, *Theorbas*, *Bowles*, *Wheels*, and *Pins* for *Pullies*; yea, and for *Tankards* to drink out of; whatever *Pliny* report concerning its *Shade*, and the stories of the Air about *Tbasur*, the Fate of *Cativolcus* mention'd by *Cæsar*, and the ill report which the *Fruit* has vulgarly obtain'd in *France*, *Spain*, and *Arcadia*; But,

How are poor Trees traduc'd?

Quam multa arboribus tribuuntur crimina falsa?

9. The *Toxic* quality was certainly in the *Liquor*, which those good *Fellows* tippl'd out of those Bottles, not in the nature of the wood; which yet he affirms is cur'd of that *Venomous* quality, by driving a *brazen-wedge* into the Body of it: This I have never tri'd, but that of the *Shade*, and *Fruit* I have frequently, without any deadly, or noxious effects: so that I am of opinion, that *Tree* which *Sebins* calls *Smilax*, and our *Historian* thinks to be our *Yew*, was some other *wood*; and yet I acknowledge that it is esteem'd noxious to *Cattel* when 'tis in the *seeds*, or newly sprouting. I may not in the mean time omit, what has been said of the true *Taxus* of the *Antients*, for being a *mortiferous* plant: Dr. *Belluccio* President of the Medical Garden at *Pisa* in *Tuscany*, (where they have this curiosity) affirms, that when his *Gard'ners* clip it (as sometimes they do) they are not able to work above half an hour at a time, it makes their heads so ake; but the leaves of this *Tree* are more like the *Fir*, and is very bushy, furnish'd with leaves from the very root, and seeming rather an *Hedge* than a *Tree*, though it grow very tall.

10. This English *Yew-tree* is easily produc'd of the *seeds*, walth'd and

and cleans'd from their *mucilage*, then buried and dry'd in *Sand* a little moist, any time in *December*, and so kept in some Vessel in the *Houfe* all *Winter*, and in some cool-shady-place abroad, all the *Summer*, sow them the *Spring* after: Some bury them in the ground like *Haws*; It will commonly be the second *Winter* ere they peep, and then they rise with their caps on their heads: Being three years old, you may transplant them, and form them into *Standards*, *Knobs*, *Walks*, *Hedges*, &c. in all which works they succeed marvellous well, and are worth our patience for their *perennial verdure*, and *durableness*: I do again name them for *Hedges*, preferable for beauty, and a stiff defence, to any plant I have ever seen.

11. He that in *winter* should behold some of our highest *Hills* in *Surrey*, clad with whole *Woods* of these two last sort of *Trees*, for divers Miles in circuit (as in those delicious *Groves* of them, belonging to the *Honourable*, my noble Friend Sir *Adam Brown* of *Bech-worth-Castle*, from *Box-hill*, and near our famous *Mole* or *Swallow*) might without the least violence to his *Imagination*, easily phantise himself transported into some new, or enchanted *Country*; for, if any spot of *England*,

— 'Tis here
Eternal Spring, and Summer all the year.

hic ovis populum, atque aliis mensibus alas;

12. But, above all the natural *Greens* which enrich our home-*Holly*. born store, there is none certainly to be compar'd to the *Agrifolium* (or *Acufolium* rather) our *Holly*, inasmuch as I have often wonder'd at our curiosity after foreign Plants, and expensive *difficulties*, to the neglect of the culture of this *unfear*, but incomparable tree; whether we will propagate it for *Use* and *Defence*, or for *fight* and *Ornament*.

A Hedge of *Holly*, Thieves that would invade,
Repulses like a growing *Palisade*;
Whose numerous leaves such *Orient Greens* invest,
As in deep *winter* do the *Spring* arrest.

— Mala furta hominum densis mucronibus ardens
Securum despicit inaccessibilis Hortum;
Exorandæ simul, toto spectabilis anno,
Et numero, & viridi foliorum luce nitentim.

Coullii Pl. l. 6.

13. Is there under *Heaven* a more glorious and refreshing object of the kind, than an impregnable Hedge of near three hundred foot in length, nine foot high, and five in diameter; which I can shew in my poor *Gardens* at any time of the year, glittering with its arm'd and vernish'd leaves? the taller *Standards* at orderly distances, blushing with their natural *Coral*: It mocks at the rudest assaults of the *Weather*, *Beasts*, or *Hedge-breakers*,

Et illum nemo impune lacescit.

It is with us of two eminent kinds, the prickly, and smoother leav'd, or as some term it, the *Free-bolly*, not unwelcome when tender, to *Sheep*, and other *Cattel*: There is also of the *White-berried*, and a *Golden variegated*: which proceeds from no difference in the species, but accidentally and *Nature* Lapse, as most such *Variegations*

tions do; since we are taught how to effect it *artificially*, namely; by sowing the *seeds*, and planting in *gravelly* soil, mixed with *stone* of *Chalk*, and pressing it hard down; it being certain, that they return to their *native Colour* when sown in richer mould.

14. I have already shew'd how it is to be rais'd of the *Berries*, (of which there is a sort bears them *yellow*) when they are ready to drop, this only omitted, that they would first be freed from their tenacious, and glutinous *Mucilage* by being wash'd, and a little bruised, then dry'd with a Cloth; or else bury them as you do the *Tom*, and *Hippi*; and let our *Forester* receives *this* for no common secret, and take notice of the effect: Remove them also after three, or four years; but if you plant the *Sets* (which is likewise a commendable way, and the *Woods* will furnish enough) place 'em *Northwards*, as they do *Quick*. Of *this*, might there living *Pales* and Enclosures be made (such as the Right Honourable my Lord *Dacres*, somewhere in *Sussex*, has a *Park* almost environ'd with, able to keep in any *Game*, as I am credibly inform'd) and cut into *square Hedges*, it becomes impenetrable, and will thrive in *bottest*, as well as the *coldest* places. I take thousands of them four inches long, out of the *Woods* (amongst the fall'n leaves whereof, they sow themselves) and so Plant them; but this should be before the *Cattel* begin to crop them, especially *Sheep*, who are greedy of them when tender: Stick them into the ground in a *moist* season, *Spring*, or early *Autumn*; especially the *Spring*, shaded (if it prove too hot and scorching) till they begin to shoot of themselves, and in very sharp Weather, and during our *Eastern Etelsans*, cover'd with *dry straw*, or *Haume*; and if any of them seem to perish, cut it close, and you shall soon see it revive. The luster, and bigger the *Sets* are, the better, and if you can procure such as are a Thumbs-breadth thick, they will soon furnish into an *Hedge*. At *Dungeness* in *Kent*, they grow naturally, amongst the very *beach* and *pibbles*: but if your ground be stiff, loosen it with a little fine gravel: This rare *Hedge* (the boast of my *Villa*) was planted upon a *burning Gravel*, expos'd to the *meridian Sun*.

15. True it is, that *time* must bring this *Tree* to perfection; it does so to all things else, & posteritati pangimus. But what if a little culture about the *Roots* (not *dunging*, which it abhors) and frequent stirring of the *mould*, double its growth? We stay *seven years* for a tolerable *Quick*, it is worth staying it *thrice*, for *this*, which has no *Competitor*.

16. And yet there is an expedient to effect it more insensibly, by planting it with the *Quick*: Let every *fifth*, or *sixth* be an *Holly-set*; they will grow up infallibly with your *Quick*, and as they begin to spread, make way for them, by extirpating the *White-thorn*, till they quite domineer: Thus was my *Hedge* first Planted, without the least interruption to the *Fence*, by a most pleasant *Metamorphosis*. But there is also another, not less applauded, by laying-along well rooted *Sets* (a yard, or more in length) and stripping off the *leaves* and *branches*: these cover'd with a competent depth of earth, will send forth innumerable *suckers*, which will suddenly advance into an *Hedge*.

17. The

17. The *Timber* of the *Holly* (besides that it is the *whitest* of all hard *woods*, and therefore us'd by the *Inlayer*, especially, under thin plates of *Towry*, to render it more conspicuous) is for all sturdy uses; the *Mill-Wright*, *Turner*, and *Engraver* prefer it to any other: It makes the best *handles*, and *stocks* for *Tools*, *Flails*, *Riding-rods* the best, and *Carters whips*; *Bowles*, *Shivers*, and *pins* for *Blocks*; Also it excels for *Door-bars* and *bolls*; and as of the *Elm*, so of this especially, they made even *hinges*, and *hooks* to serve instead of *Iron*, and of the *Bark* is compos'd our *Bird-lime* thus.

18. Pill a good quantity of the *Bark* about *Midsummer*, fill a *Vessel* with it, and put to it *Spring-water*; then boyl it, 'till the *grey*, and *white bark* rise from the *green*, which will require near twelve hours boiling; then taking it off the *fire*, separate the *barks*, the *water* first well drained from it: Then lay the *green bark* on the *Earth*, in some cool *Vault* or *Cellar*, covering it with any sort of *green*, and rank *weeds*, such as *Dock*, *Thistles*, *Hemlock*, &c. to a good thickness: Thus let it continue near a *fort-night*, by which time 'twill become a perfect *mucilage*: then pound it all exceedingly in a *stone mortar*, 'till it be a tough *paste*, and so very fine, as no part of the *bark* be discernable: This done, *wash* it accurately well in some running stream of *Water*, as long as you perceive the least *ordure* or *motes* in it, and so reserve it in some *earthen* pot, to purge and *ferment*, scumming it as often as any thing arises for four, or five days, and when no more *slub* comes; change it into a *fresh* Vessel of earth, and reserve it for use, *Thus*: Take what quantity you please of it, and in an *earthen pipkin*, add a *third* part of *Capons*, or *Goose-grease* to it, well clarified; or *Oyl* of *Walnuts*, which is better: Incorporate these in a gentle *fire*, continually stirring it 'till it be *cold*, and thus your *Composition* is finish'd. But to prevent *Frosts* (which in severe weather will sometimes invade it on the *Rods*.) take a quarter of as much *Oyl* of *Petroleum*, as you do of *Grease*, and no cold whatever will congeal it. The *Italians* make their *Viscbio*, of the *Berries* of the *Mistletoe* of *Trees*, treated much after the same manner; but then they mix it with *Nut-oil*, an ounce to a pound of *Lime*, and taking it from the *fire*, add half an ounce of *Turpentine*, which qualifies it also for the *Water*. Great quantities of *Bird-lime* is brought to us out of *Turkie*, and from *Damascus*, which some conceive to be made of *Sebestens*, finding sometimes the kernels: This *lime* is of a greener colour, subject to *Frosts*, and impatient of *Wet*, nor will last above a *year* or two good: Another sort comes also out of *Syria*, of a *yellow* hue; Likewise from *Spain*, whiter than the rest, which will resist the *water*, but is of an ill scent. I have been told that the *Cortex* of our *Laniona*, or *Wayfaring* shrub, will make as good *Bird-lime* as the best. But, let these suffice, being more than as yet, any one has publish'd. The superiour *Leaves* of *Holly-Trees*, dry'd to a fine powder, and drunk in *White-wine*, is prevalent against the *Stone*, and cures *Fluxes*; and a dozen of the mature *Berries*, being swallow'd, purge *Phlegm* without danger.

To

To which the learned Mr. Ray (in *Append. Plant. Angl.*) adds a *Xythogalum*, made of *Milk* and *Beer*, in which is boil'd some of the most pointed *leaves*, for asswaging the torment of the *Colic*, when nothing else has prevail'd.

Juniper.

19. Of *Juniper* we have *three sorts*, (Male, Female, Dwarf) whereof one is much taller, and more fit for Improvement: The wood is *yellow*, and being cut in *March*, *sweet* as *Cedar*, whereof it is accounted a *spurious* kind; all of them difficult to remove with success; nor proper they being shaded much, or over-drip'd.

20. I have rais'd them abundantly of their *seeds* (neither *watring*, nor *dunging the soil*) which in two months will peep, and being govern'd like the *Cypress*, apt for all the employments of that beautiful Tree: To make it grow *tall*, *prune*, and cleanse it to the very *stem*, the *male* best. The discreet loosening of the *Earth* about the *Roots* also, makes it strangely to prevent your expectations, by suddenly spreading into a *bus* fit for a thousand pretty Employments; for coming to be much unlike that which grows *wild*, and is subject to the treading, and cropping of *Cattle*, &c. it may be form'd into most beautiful, and useful *Hedges*: My Brother having cut out of one only *Tree*, an *Arbour* capable for *three* to sit in: It was at my last measuring *seven* foot square, and *eleven* in height; and would certainly have been of a much greater altitude, and farther spreading, were it not continually kept *shorn*: But what is most considerable, is, the little time since it was *planted*, being yet hardly *ten years*, and then it was brought out of the common a slender *Bus*, of about *two foot* high: But I have experimented a proportionable improvement in my own *Garden*, where I do mingle them with *Cypress*, and they would perfectly become their stations, where they might enjoy the *Sun*, and may very properly be set, where *Cypress* does not so well thrive, namely, in such *Gardens*, and *Courts* as are open to the *Eddy-Winds*, which indeed a little discolours our *Junipers* when they blow *Easterly* towards the *Spring*, but they constantly recover again; and besides, the Shrub is *tonfide*, and may be *shorn* into any form. I wonder *Virgil* should condemn its shadow, I suspect him mis-reported: For,

21. The *Berries* afford (besides a tolerable *Pepper*) one of the most universal *Remedies* in the world, to our crazy *Foresters*; The *Berry* swallow'd only, instantly appeaseth the *Wind-Colic*, and in decoction most *sovereign* against an inveterate *Cough*: They are of rare effect being steeped in *Beer*. The *Water* is a most singular *specificque* against the *Gravel* in the *Reins*; But all is comprehended in the virtue of the *Theriacle*, or *Electuary*, which I have often made for my poor *Neighbours*, and may well be term'd the *Foresters Panacea* against the *Stone*, *Rheum*, *Phtisic*, *Droisie*, *Jaundies*, inward *Impostumes*, nay, *Palsie*, *Gout*, and *Plague* it self taken like *Venice-Treacle*. Of the extracted *Oyl* (with that of *Nuts*) is made an excellent good *Vernish* for *Pictures*, for *Wood-work*, and to preserve *polish'd Iron* from the *rust*. The *Gum* is good to rub on *parchment* to make it bear *Ink*, and the *Coals*, which

which are made of the *Wood*, endure the longest of any: See *St. Hieron* ad *Fabiolam* upon that expression *Psal.* 120. v. 4: If it arrive to full growth, it is *Timber* for many curious works; for *Tables*, *Chests*, small *Carvings* and *Images*, *spoons*, wholesome to the *mouth*; *spits* to roast *meat* on, to which it gives a rare *taste*, but it should be of old, and dry wood; nay, I read of some large enough for *beams*, and *rafters*. The very *chips* render a whole some *perfume* within doors, as well as the *duty blossoms* in *Spring* without.

22. And since we now mention'd *Pepper*, it is by the most prudent, and princely care of his *Majesty*, that I am assur'd of a late solemn *Act of Council*, enjoying the preserving of that incomparable *Spice*, which comes to us from *Jamaica* under that denomination; though in truth it be a mixture of so many *Aromatics* in one, that it might as well have been call'd *Cinnamon*, *Nutmeg* or *Mace*, to every of which it seems something *allied*: And that there is not only prohibited the destruction of these *Trees* (for it seems some *Prodigals* us'd to cut them down, for the more easie gathering but order taken likewise for their *propagation*, and that *Assays*, and *Samples* be from time to time sent over, what other *Fruits*, *Trees*, *Gums* and *Vegetables* may there be found, and which I prognostick will at last also incite his *Majesty*, and the *Planters* there, to think of procuring *Cinnamon*, *Cloves* and *Nutmeg-trees* indeed, from the *East-Indias*, and what other useful *Curiosities* will not approach our *Northern Bear* (and that are *incicrabiles* amongst us) and to plant them in *Jamaica*, and other of his *Majesties Western Islands*, as a more safe, and frugal expedient to humble our *emulous Neighbours*; since there is nothing in their *Situation*, or defect of *Natures* benignity, which ought in the least to discourage us: And what if some of the *Trees* of those *Countrys* (especially such as aspire to be *Timber*, and may be of improvement amongst us) were more frequently brought to us likewise here in *England*; since we daily find how many rare *Exotics*, and strangers with little care, become *endeniz'd*, and so contented to live amongst us, as may be seen in the *Platanus*, *Constantinople-Chest-nut*, the greater *Glandiferous Ilex*, *Cork*, *Nux Vescaria* (which is an hard Wood, fit for the *Turner*, &c.) the *Syrax*, *Bead-tree*, the famous *Lotus*, *Virginian Acacia*, *Guaiacum Patavinum*, *Paliurus*, *Cypress*, *Pines*, *Fir*, and sundry others, which grow already in our *Gardens*, expos'd to the *Weather*; and so doubtless would many more: So judiciously observ'd is that of the learned *Author* of the *History of the Royal Society*, Part. 3. Sect. 28. 'That whatever attempts of this nature have succeeded, they have redounded to the great advantage of the *Undertakers*. The *Orange of China* being of late brought into *Portugal*, has drawn a great *Revenue* every year from *London* alone. The *Vine* of the *Rhene*, taking root in the *Canaries*, has produc'd a far more delicious juice, and has made the *Rocks*, and *Sun-burnt* *Alhes* of those *Islands*, one of the richest spots of *Ground* in the *World*. And I will also in

stance in that which is now in a good forwardness: *Virginia* has already given *Silk* for the clothing of our *King*; and it may happen hereafter, to give *Cloaths* to a great part of *Europe*, and a vast *Treasure* to our *Kings*; If the *Silk-worms* shall thrive there (of which there seems to be no doubt) the profit will be inexpressible. We may guess at it, by considering what numbers of *Caravans*, and how many great *Cities* in *Persia*, are maintain'd by that *Manufacture* alone, and what mighty *Customs* it yearly brings unto the *Sophi's* Revenue. Thus He; And to return to that of *Trees*, and *Plants*, the Industry we have recommended, would questionable in less than half an *Age*, produce us wonders, by introduction, if not of quite different, yet of better kinds, and such variety for pulchritude, and sweetness; that when by some Princely Example, our late *Pride*, *Effeminacy*, and *Luxurie* (which has to our vast charges, excluded all the *Ornaments* of *Timber*, &c. to give place to *Hanging*, *Embroideries*, and foreign *Leather*) shall be put out of Countenance, we may hope to see a new face of things, for the encouragement of *Planters* (the more immediate Work of *God's* hands) and the natural, wholesome, and ancient use of *Timber*, for the more lasting occasions, and furniture of our *Dwellings*: And though I do not speak all this for the sake of *Joyn-stools*, *Benches*, *Cup-boards*, *Massy Tables*, and *Gigantic Bed-Beds*, the hospitable *Utensils* of our fore-Fathers; Yet I would be glad to encourage the *Carpenter*, and the *Joyner*, and rejoyce to see, that their *Work*, and *skill* do daily improve; and that by the Example, and application of his *Majesties* *Universities*, and *Royal Society*, the *Restoration* and *Improvement* of *Shipping*, *Mathematical*, and *Mechanical* Arts, the use of *Timber* grows daily in more reputation: And it were well if *Great Persons* might only be indulg'd to enrich, and adorn their *Palaces* with *Tapistry*, *Damase*, *Velvet*, and *Persian* furniture, whilst by some wholesome *Sumptuary* Laws, the universal excess of those *Costly*, and *Luxurious* *Moveables*, were prohibited meaner Men, for divers *politic* Considerations and Reasons, which it were easie to produce; but by a less influence than *severer Laws*, it will be very difficult, if not altogether impossible, to recover our selves from a softness, and *vanity*, which will in time not only effeminate, but undo the Nation.

Laurel.

23. But to *Crown* all, I will conclude with the *Laurel*, or *Cherry Bay*, which by the Use we commonly put it to, seems as if it had been only destin'd for *Hedges*, and to cover bare *Walls*; whereas, being planted upright, and kept to the *Standard*, by cutting away the collateral *Branches*, and maintaining one *stem*, it will rise to a very considerable *Tree*; and (for the first twenty years) resembling the most beautiful-headed *Orange* in shape, and verdure, arrive in time, to emulate even some of our lusty *Timber-trees*; so as I dare pronounce the *Laurel* to be one of the most proper, and ornamental *Trees* for *Walks*, and *Avenues* of any growing.

24. Pity it is they are so abus'd in the *Hedges*, where the lower Branches

Branches growing sickie, and dry, by reason of their frequent, and unseasonable cutting (with the genius of the Tree, which is to spend much in wood) they never succeed, after the first six, or seven years; but are to be new planted again, or abated to the very *Roots* for a fresh *shoot*.

25. But would you yet improve the *Standard* which I celebrate, to greater, and more speedy exaltation? bud your *Laurel* on the *Black-Cherry stock* to what height you please; This I had from an ocular testimony, who was more than somewhat doubtful of such *Alliances*, though something like it in *Palladius* speaks it not to be impossible;

A Cherry Graft on Laurel-stock does stain
The Virgin Fruit in a deep double grain.

Infruit lauro Cerasus, partique coacta
Tingit adoptivus virginis ora pudor.

26. They are rais'd of the *Seeds*, or *Berries* with extraordinary facility, or propagated by *Layers*, *Talce*, and *cuttings*, set about the later end of *August*, or earlier at *St. James-tide*, wherever there is shade and moisture. I find little concerning the *Mechanical* uses of the *Laurel*; but than its *Attributes* of *old*, there was nothing more glorious and magnificent; For,

From Laurel chew'd the Pythian Priest his rose,
Events of future Actions to disclose.
Laurel Triumphant Generals did wear,
And Laurel Heralds in their hands did bear.
Poets ambitious of un fading praise,
Phaëbus, the Muses all are crown'd with Bays.
And Virtue to her sons the Prize does name
Symbol of Glory, and immortal Fame.

Tu sacros Phœbi tripodas, tu Sidera sentis,
Et casus apertis verum presaga futuros.
Te juvat armorum strepitus, clangorque tubarum;
Torce acies medias, seroque pericula belli.
Accendis bullantem animas; tu Cynthia ipse,
Te Mæse, Vatesque sacri optavere Coronam;
Ipsa suis Virtus te spem proponit alumnis,
Tantum servatus valuit pudor, & bona fama.

Rapius.

I have now finish'd my *Planting*: A word or two concerning their *Preservation*, and the *Cure* of their *Infirmities*.

C H A P. XXVII.

Of the Infirmities of Trees.

Infirmities.

THE Diseases of Trees are various, according to the Rustick Rhyme,

The Calf, the Wind-fluc and the Knot,
The Canker, Scab, Scurf, Sap and Rot.

Affecting the several parts: These invade the Roots; *Stony*, and *Rockie* grounds, *Wey*, and all *Glimbers*, *Weeds*, *Suckers*, *Fern*, *Wet*, *Mice*, *Moles*, *Winds*, &c. to these may be added *Siderations*, and even *Plagues*, *Tumours*, *Distortions*, *Lacrymations*, *Tophi*, *Gouts*, *Carbuncles*, *Ulcers*, *Crudities*, *Fungosities*, *Gangreens*, and an *Army* more, whereof some are hardly discernable, yet *Enemies*, which not foreseen, makes many a bargain of *standing-wood* (though seemingly fair) very costly ware.

1. *Weeds*, are to be diligently pull'd up by hand after *Rain*, whiles your *seedlings* are very young, and till they come to be able to kill them with *shade*, and *over-dripping*: And then are you for the *obstinate*, to use the *Haw*, *Fork*, and *spade*, to extirpate *Dog-grass*, *Bear-bind*, &c.

2. *Suckers* shall be duly eradicated, and with a sharp *spade*, dexterously separated from the *Mother-roots*, and transplanted in convenient places for *propagation*, as the *Season* requires. Here Note, that *Fruit* grafted upon *Suckers*, are more dispos'd to produce *Suckers*, than such as are propagated upon good *Stocks*.

3. *Fern*, is best destroy'd by striking off the *Tops*, as *Targuin* did the heads of the *Poppies*: This done with a good wand, or cudgel, at the decrease in the *Spring*, and now and then in *Summer*, kills it in a year or two, beyond the vulgar way of *Mowing*, or *burning* which rather encreases, than diminishes it.

4. Over-much *Wet* is to be drain'd by *Trenches*, where it infests the *Roots* of such kinds as require drier ground: But if a *drip* do fret into the body of a *Tree* by the head (which will certainly decay it) cutting first the place smooth, *stop*, and cover it with *loam* and *hay*, or a *cerecloth*, till a new bark succeed. But not only the *Wet*, which is to be diverted by *Trenching* the ground, is exitial to many *Trees*, but their repletion of too abundant *nourishment*; and therefore sometimes there may be as much occasion to use the *Lancet*, as *Phlebotomie*, and *Venesectio* to *Animals*; especially if the *Hypothefis* hold, of the superfluous moisture's descent into the *Roots*, to be re-concocted; but where, in case it be more copious than can be there elaborated, it turns to corruption, and sends up a tainted *juice*, which perverts the whole *habitus* of the *Tree*: In this exigence therefore, it were perhaps more counsellable, to draw it out by a deep *Incision*, and to depend upon a new

See Chap. 30.
Stiff. 25.

new supply, than upon confidence of correcting this evil quality, by other medications, to let it perish. These infest the Bark; *Bark-bound*, *Teredo*, or *Worm*, *Conys*, *Moss*, *Wey*, &c.

5. The *Bark-bound* are to be released by drawing your *knife* rind-deep from the *Root*, as far as you can conveniently, drawing your *knife* from the top downwards half-way, and at a small distance, from the bottom upwards, the other half; this, in more places, as the bulk of the *stem* requires; and if crooked, cut deep, and frequent in the *ham*; and if the *gaping* be much, filling the *rift* with a little *Cow-dung*; do this on each side, and at *Spring*, *February* or *March*: also cutting off some *branches* is profitable; especially such as are blasted or lightning-struck: If (as sometimes also) it proceed from the *baking* of the *Earth* about the *stem*, lighten, and stir it.

6. The *Teredo*, *Coff*, and other *Worms*, lying between the *Body*, and the *Bark*, poison that passage to the great prejudice of some *Trees*; but the *holes* being once found, they are to be taken out with a light *Incision*, the wound covered with *loam*; and the *Wood-pecker*, and other *Birds*, often pitching upon the *stem* (as you may observe them) when knocking with their *bills*, mark that the *Tree* is infected, at least, between the *Bark*. But there are divers kinds of these *Exodagoyoi*, of which the *myrddoy* or *Tarmes* we have mentioned, will sometimes make such a noise in a *Tree*, as to awaken a sleeping man: The more *ragons* are the *Coffs*, of old had in *delicats* amongst the *Epicures*, who us'd to fatten them in *slowre*; and this, (as *Tertullian*, and *S. Hierom* tell us) was the chief food of the *Hierophanta Cerevis*; as they are at this day a great *regalo* in *Japan*: In the mean time, experience has taught us, that *Millipedes* *Wood-lice* (to be plentifully found under old *timber-logs*, being dry'd, and reduc'd to *Powder*, and taken in drink) are an admirable *specific* against the *Jaundies*, *Scorbut*, to purifie the *blood*, and clarify the *sight*.

Trees (especially *Fruit-bearers*) are infested with the *Measels*, by being burned, and scorched with the *sun* in great drouths: To this commonly succeeds *lousiness*, which is cur'd by boring an *hole* into the principal *root*, and pouring in a quantity of *Brandy*, stopping the *Orifice* up with a *Pin* of the same *Wood*.

Crooked Trees are reform'd by taking off or topping the *preponderers*, whilst charg'd with *Leaves* or *Wood*.

Excorticated and bark-bared *Trees*, may be preserved by nourishing up a *shoot* from the foot, or below the *stripped* place, and inserting it into a *slit* above the wounded part; to be done in the *Spring*, and secur'd firm air, as you treat a *Graft*: This I have out of the very industrious Mr. Cook p. 48. But Dr. Merris brought us in this Relation to the *R. Society*, That making a square *section* of the *Rinds* of *Ash*, and *Sycamore* (*March* 1664.) whereof three sides were cut, and one not, the succets was, that the whole *Bark* did *unite*, being bound with pack-thread, leaving only a *Scar*: But being separated intirely from the *Tree*, namely several parts of the *Bark*, and at various depths, leaving on some part

part of the *Bark*, others cut to the very *Wood* it self, being tied on as the former, a new *Rind* succeeded in their place; but what was cover'd over beyond the places of *Incision* with *Diachylon Plaster*, and also bound as the rest, did within the space of three weeks, unite to the *Tree*, though with some shriveling and scar: The same Experiment try'd about *Michaelmas*, and in the *Winter*, came to nothing: Where some *Branches* were decorticated quite round, without any Union, a withering of the *Branch* beyond the *Incision*, ensu'd: Also a *Twig* separated from a *Branch*, with a sloping cut, and fastn'd to it again in the same posture, bound, and cover'd with the former *Plaster*, wither'd in three days time.

Dr. Plot speaks of an *Elm* growing near the *Bowling-green* at *Magdalen College*, quite round *disbark'd*, almost for a *Tard* near the ground, which yet flourishes exceedingly; upon which he dilates into an accurate discourse, how it should possibly be; all *Trees* being held to receive their nutrition between the *Wood*, and the *Bark*, and to perish upon their separation; this *Tree* being likewise *hollow*, as a *druze*, and its out-moist surface (where decorticated) dry, and dead? The solution of this *Phenomenon* (and to all appearance, from the verdant head) could not have been more philosophically resolv'd, than by the *Hypothesis* there produced by the *Doctor*, who assures me, he was yet deliberating whether the *Tree* being *hollow*, it might not possibly proceed from some other latent cause, as afterwards he discover'd; when having obtain'd permission to open the *body* of it, he found another *Elm*, letting down its *Stem* all the length of this empty *Cave*, and striking *Root* when it came to the *Earth*, from whence it deriv'd nourishment, maintains a flourishing top, and has (till now) pass'd for a little *miracle*, as it still may do for a thing extraordinary, and rare enough; considering not only its passage, and how it should come there, unless haply some of the *Samera*, or *Seed* of the old *Tree* (when pregnant) should have luckily fallen down within the hollow pipe, or (as might be conjectur'd) from some *Sucker* springing of a juicy *Root*, but the strange incorporating of the superiour part of the *bole*, with the old hollow *Tree* which embraces it; not by any perceptible *Roots*, but as if it were but one *body* with it, whilst the rest of the vaginated *stem* touches no other part of the whole *Cavity*, till it comes to the ground; This being besides very extraordinary, that a *Tree*, which naturally grows *taper* as it approaches the top, this should swell, and become bigger there, than it is below. But this the *Doctor* will himself render a more minute *Account* of in the next *Impression* of that excellent *Piece* of his; nor had I anticipated it on this occasion, but to let the world know (in the mean time) how ingenuously ready he is, to acknowledge the *Mistake*, as he has been successful in discovering it.

Deer, *Conies*, and *Hares* by barking the *Trees* in hard *Winters*, spoil very many tender *Plantations*: Next to the utter destroying them, there is nothing better than to anoint that part which is within their reach, with *Stercus humanum*, tempered with a little *Water*,

Water, or *Urine*, and lightly brushed on; this renewed after every great *Rain*: But a *cleanlier* than this, and yet which *Conies*, and even *Cattel* most abhor, is to water, or sprinkle them with *Tanners Liquor*, viz. That, which they use for dressing their *hides*; also to tie *Thumb-bands* of *Hay* and *Straw*, round them as far as they can reach.

8. *Moss*, is to be rubb'd, and scrap'd off with some fit instrument of *Wood*, which may not excorticate the *Tree*, or with a piece of *Hair-cloth* after a fobbing *Rain*: But the most infallible Art of *Emascation* is taking away the *cause*, which is superfluous moisture in *clayie*, and spewing grounds.

9. *Ivy* is destroy'd by digging up the *Roots*, and loosning its hold: And yet even *Ivy* it self (the destruction of many fair *Trees*) if very old, and where it has long invested its support, if taken off, does frequently kill the *Tree*, by a too suddain exposure to the unaccustom'd cold: Of the *Roots* of *Ivy* (which with small Industry, may be made a beautiful Standard) are made curiously polish'd, and fleck'd cups, and boxes, and even *Tables* of great value. *Mistletoe*, and other *Excrecences* to be cut, and broken off. But the *Fungi* (which prognosticate a fault in the *Liver*, and *Entrails* of *Trees* as we may call it) is remedied by *Abrasion*, *Friction*, *Interlucation* and exposure to the *Sun*.

10. The *Bodies* of *Trees* are visited with *Canker*, *Hollowness*, *Hornets*, *Earwigs*, *Snails*, &c.

11. The *Wind-shock* is a *bruise*, and *shiver* throughout the *Tree*, though not constantly visible, yet leading the *Warp* from smooth renting, caused by over-powerful *Winds*, when young, and perhaps, by subtil *Lightnings*: The best prevention is *shelter*, choice of place for the *Plantation*, frequent *spreading*, whilst they are yet in their youth.

12. *Cankers* (caused by some stroak, or galling, or by hot, and burning land) are to be cut out to the quick, the scars emplasred with *Tar* mingled with *Oyl*, and over that, a thin spreading of loam; or else with *clay*, and *Horse-dung*; but best, with *hogs-dung* alone, bound to it in a rag: or by laying *Wood-ashes*, *Nettles*, or *Fern* to the roots, &c. But if the *Gangreen* be within, it must be cured by *nitrous*, *sulphureous* and drying applications, and by no means, by any thing of an *unctuous* nature, which is extial to *Trees*. *Tar*, as was said, only excepted, which I have experimentally known to preserve *Trees* from the envenom'd teeth of *Goats*, and other injuries; the intire *stem* smear'd over, without the least prejudice, to my no small admiration: But for over hot, and torrid land, you must sadden the mould about the root with *Fond-mud*, and *Neats-dung*; and by *Grafting Fruit-trees* on stocks rais'd in the same mould, as being more homogeneous.

13. *Hollowness*, is contracted, when by reason of the ignorant, or careless lopping of a *Tree*, the wet is suffer'd to fall perpendicularly upon a part, especially the *Head*: In this case, if there be sufficient sound wood, cut it to the quick, and close to the body, and cap the hollow part with a *Tarpanlin*, or fill it with good stiff loam,

loam, Horse-dung and fine hay mingled. This is one of the worst of Evils, and to which the Elm is most obnoxious. Old broken boughs if very great, are to be cut off at some distance from the body, but the smaller, close.

14. Hornets, and Wasps, &c. by breeding in the hollownes of Trees, infect them, and are therefore to be destroy'd by stopping up their entrances with Tar, and Goat-dung, or by conveying the fumes of brimstone into their Cells.

15. Earwigs, and Snails do seldom infest Forest-trees, but those which are Fruit-bearers, and are destroy'd by setting Boards, or Tiles against the Walls, or the placing of neat hoofs, or any hollow thing upon small stakes; also by enticing them into sweet waters, and by picking the Snails off betimes in the Morning, and rainy Evenings: I advise you to visit your Cypress-Trees on the first Rains in April; you shall sometimes find them cover'd with young snails, no bigger than small pease: Lastly, Branches, Buds, and Leaves extremely suffer from the Blasts, Jaundies, and Caterpillars, Rooks, &c. Note, that you should visit the Boards, Tiles, and Hoofs, which you set for the retreat of those Insects, &c. in the heat of the day, to shake them out, and kill them.

16. The blasted parts of Trees are to be cut away to the quick; and to prevent it, smother them in suspicious weather, by burning moist straw with the wind, or rather the dry, and superfluous cuttings of Aromatic plants, such as Rosemary, Lavender, Juniper, Bay, &c. I use to whip, and chastise my Cypresses with a wand, after their Winter-burnings, till all the mortified, and scorched parts flie-off in dust, as long almost as any will fall, and observe that they recover and spring the better. Mice, Moles, and Fishmires cause the Jaundies in Trees, known by the discolour of the Leaves and Buds.

17. The Moles do much hurt, by making hollow passages, which grow mustie; but they may be taken in Traps, and kill'd, as every Woodman knows: It is certain that they are driven from their haunts by Garlick for a time, and other heady smells, buried in their passages.

18. Mice, with Traps, or by sinking some Vessel almost level with the surface of the ground, the Vessel half full of Water, upon which let there be strew'd some hulls, or chaff of Oats; also with Bane.

19. Destroy Fishmires with scalding water, and disturbing their bids, or rubbing the Stem with Cow-dung, or a decoction of Tithymale, washing the infected parts; and this will insinuate, and chase them quite out of the chinks and crevices, without prejudice to the Tree, and is a good prevention of other Infirmities: also by laying Soot, Saw-dust, or refuse Tobacco, where they haunt.

20. Caterpillars, by cutting off their webs from the twigs before the end of February, and burning them; the sooner the better: If they be already hatched, wash them off with Water, in which some of the Caterpillars themselves, and Garlick have been bruised, or the juice of Rue; or choak, and dry them with smother of Galbanum,

Galbanum, Sboosals, Hair, and some affirm that planting the Pionie near them, is a certain remedy; but there is no remedy so facile, as the burning them off with small wisps of dry straw, which in a moment rid's you.

21. Rooks, do in time, by pinching off the buds, and tops of Trees for their Nests, cause many Trees and Groves to decay: their dung propagates Nettles and Weeds, and chokes young seedlings: They are to be shot, and their Nests demolish'd. The Bullfinch and Titmouse also eat off, and spoil the Buds of Fruit-trees, prevented by Clappers, or caught in the Wyre-mouse-trap with teeth, and baited with a piece of rusty Bacon, also with Lime-twig. But if Cattel breaks in before the time, conclamation is, especially Goats, whose mouths, and breath is poison to Trees; they never thrive well after, and Varro affirms, if they but lick the Olive tree, they become immediately barren.

22. Another touch at the Winds; for though they cannot properly be said to be Infirmities of Trees; yet they are amongst the principal causes that render Trees infirm. I know no surer protection against them, than (as we said) to shelter, and stake them whilst they are young, till they have well establish'd Roots; And with this caution, that in case any goodly Trees (which you would desire especially to preserve and redress) chance to be prostrated by some impetuous, and extraordinary storm; you be not over hasty to carry him away, or despair of him; but first let me persuade you, to poll him close, and so let him lie some time; for by this means, many vast Trees have rais'd themselves by the vigour only of the remaining Roots, without any other assistance; so as people have pronounc'd it Miraculous, as I could tell you by several instances; besides what Theophrastus relates c. 19. of that huge Platanus, which rise in one Night in his observation; and the like I find hapn'd in more than one Tree, near Bononia in Italy, An. 1657. when of late, a turbulent Gust had almost quite eradicated a very large Tract of huge Poplars, belonging to the Marchioness Eleban-tucca Spada, that universally erected themselves again, after they were beheaded, as they lay even prostrate: What says the Naturalist? Prostratas restitui plerumque, & quadam terra cicatrice reviviscere, vulgare est: 'Tis familiar (says Pliny) in the Platanus, which are very obnoxious to the Winds, by reason of the thickness of their branches, which being cut off, and discharged, restore themselves. This also frequently happens in Wall-nuts, Olive-trees, and several others, as he affirms; l. 16. c. 31. These (amongst many others) are the Infirmities to which Forest-trees are subject whilst they are standing; and when they are fell'd, to the Worm; especially if cut before the sap be perfectly at rest: But to prevent, or cure it in the Timber, I recommend this Secret as the most approv'd.

23. Let common yellow Sulphur be put into a cucurbit-glass, upon which, pour so much of the strongest Aqua-fortis, as may cover it three fingers deep: Dissolve this to dryness, which is done by two, or three Rectifications: Let the Sulphur remaining in the bottom (being of a blackish, or sad-red colour) be laid on a Marble,

ble, or put into a *Glass*, where it will easily dissolve into *Oil*: With this, *anoint* what is either *infect*ed, or to be preserv'd of *Timber*. It is a great, and excellent *Arcanum* for tinging the *Wood* with no unpleasant colour, by no Art to be walsh'd out; and such a preservative of all manner of *Woods*, nay, of many other things; as *Ropes*, *Cables*, *Fishing-nets*, *Masts of Ships*, &c. that it defends them from *putrefaction*, either in *Waters*, under, or above the earth, in the *Snow*, *Ice*, *Air*, *Winter* or *Summer*, &c. It were superfluous to describe the process of the *Aqua-fortis*; It shall be sufficient to let you know, That our common *Copperas* makes this *Aqua-fortis* well enough for our purpose, being drawn over by a *Retort*: And for *Sulphur*, the *Island of St. Christophers* yields enough, (which hardly needs any *Refining*) to furnish the whole world. This *Secret* (for the *Curious*) I thought fit not to omit; though a more compendious, three or four *anointings* with *Linsed Oyl*, has prov'd very effectual: It was experimented in a *Wall-nut Table*, where it destroy'd millions of *Worms* immediately, and is to be practic'd for *Tables*, *Tubes*, *Mathematical-Instruments*, *Boxes*, *Bed-Heads*, *Chairs*, *Rarities*, &c. *Oyl of Wall-nuts* will doubtless do the same, is sweeter, and a better *Vernish*; but above all, is commended *Oyl of Cedar*, or that of *Juniper*.

24. Hitherto I have spoken of *Trees*, their *kinds*, and *propagation* in particular: Now a word or two concerning their *ordering* in general, as it relates to *Copp'ces*, *Lopping*, *Felling*, &c. Then I shall add something more concerning their *Uses*, as to *Fuel*, &c. and cast such accidental *Lessons* into a few *Aphorisms*, as could not well be more regularly insert'd.

Lastly, I shall conclude, with some more serious *Observations*, in reference to the main *Design*, and project of this *Discourse*, as it concerns the *Improvement* of his *Majesties Forests*, for the *honour*, and security of the whole *Kingdom*.

CHAP. XXVIII.

Of Copp'ces.

Copp'ces.

1. *Stiva Cadua* is (as *Varro* defines it) as well *Copp'ces* to cut for *Fuel* as for use of *Timber*; and we have already shew'd how it is to be rais'd, both by *sowing* and *planting*. I shall only here add, that if in their first *Designation*, they be so laid out, as to grow for several *Falls*; they will both prove more *profitable*, and more *delightful*: More *profitable*, because of their annual *Succession*; and more *pleasant*, because there will always remain some of them *standing*; and if they be so cast out, as that you leave it straight, and even *Intervals* of eighteen, or twenty foot for *grass*, between *Spring-wood* and *Spring-wood*, securely *Fenc'd*, and preserv'd; the

the *Pastures* will lie both *warm*, and prove of exceeding *delight* to the *Owner*. These *Spaces* likewise useful, and necessary for *Cart-way*, to fetch out the *wood* at every *Fall*. There is not a more noble, and worthy *Husbandry*, than is this, which rejects no sort of *Ground*, as we have abundantly shew'd; since even the most *boggy* places, may be *drein'd*, and cast, as to yield its increase, by *Planting* the *dryer* sorts upon the *Ridges* and *banks* which you cast up, where they will *thrive* exceedingly: And then *Willow*, *Sallow*, *Alder*, *Poplar*, *Sycamor*, *Black Cherry*, &c. will shoot tolerably well, on the lower, and more *Uiginous*; with this caution, that for the first two years, they be kept diligently *weeded* and *cleans'd*, which is as necessary as *fencing*, and guarding from *Cattel*. Our ordinary *Copp'ces* are chiefly upon *Hazel*, or the *Birch*; but if amongst the other kinds store of *Ash*, *Chestnut*, *Sallow*, and *Sycamor*, (at least one in four) were sprinkled in the *Planting*, the *profit* would soon discover a difference, and well recompence the industry. Others advise us to *Plant* shoots of *Sallow*, *Willow*, *Alder*, and of all the *swift-growing* *Trees*, being of seven years growth, *sloping* off both the ends towards the ground, to the length of a *Billet*, and burying them a reasonable depth in the earth. This will cause them to put forth seven or eight *branches*, each of which will become a *Tree* in a short time, especially, if the soil be moist. The nearest *distance* for these *Plantations* ought never to be less than *five* foot at first, since every *felling* renders them wider for the benefit of the *Timber*, even to *thirty*, and *forty* foot in five, or six *fellings*.

2. Though it be almost impossible for us to prescribe at what *Age* it were best *Husbandry* to fell *Copp'ces* (as we at least call *best Husbandry*) that is, for most, and greatest gain; since the *Markets*, and the *kinds* of *Wood*, and emergent *uses* do so much govern; yet *Copp'ces* are sometimes of a competent stature after *eight*, or *nine* years from the *Acorn*, and so every *eight*, or *ten* years successively, will rise better and better: But this had need be in extraordinary ground, otherwise you may do well to allow them *twelve*, or *fifteen* to fit them for the *Ax*; but those of *twenty* years standing are better, and far advance the price; especially, if *Oak*, and *Ash*, and *Chestnut* be the chief furniture. Some of our old *Clergy* *Spring-Woods* heretofore have been let rest till twenty five, or thirty years, and have prov'd highly worth the attendance; for by that time, even a *Seminary* of *Acorns*, will render a considerable advance, as I have already exemplified in the *Northamptonshire Lady*. And if *Copp'ces* were so divided, as that every year there might be some *fell'd*, it were a continual, and a present Profit: Seventeen years growth affords a tolerable *Fell*; supposing the *Copp'ce* of seventeen *Acres*, one *Acre* might be yearly *fell'd* for ever; and so more, according to proportion; but though the seldom *Fall*, yields the more *Timber*, yet the frequent makes the *under-wood* the thicker; therefore at ten, or twelve years growth (says Mr. Cook) in shallow ground, and fourteen in deeper: If many *Timber-Trees* grow in your *Copp'ces* which are to be cut down, fell both *them*, and the *under-*

wood as near the ground as may be; but this is to be understood where the wood is very thick; otherwise, 'tis advisable to stock-up the thinner, especially in great Timber, and to set in the holes, *Elms, Cherry, Poplar, Sallows, Service*; and to these Trees which are apt to grow from the running-root thicken the Wood exceedingly; whilst the very Roots will pay for the grubbing, and yield you some feet of the best Timber; whereas being let stand, nothing would have grown: If the Ground be a shallow soil, forbear filling the holes quite, but set some running-wood in the loosened Earth, and the ends of the old roots being cut, will furnish the sides of the holes speedily: In thin Copp'ces 'tis profitable to lay some boughs a-thwart, which will be rooted to advantage against next fall: All great rotten-Stubs among your under-woods should be extirpated, as making way for seedlings, and young roots to spring and run: The cutting slanting, smooth, and close is of great importance; and frequent felling gives way, and air to the sub-nascent seedlings, and the rest will make lusty shoots.

3. As to what Numbers and Scantlings you are to leave on every Acre, the Statutes are our general guides, at least the legal. It is a very ordinary Copp'ce, which will not afford three or four Firsts, that is, *Bests*; fourteen Seconds, twelve Thirds, eight Wavers, &c. according to which proportions, the sizes of young Trees in Copp'cing, are to succeed one another. By the Statute of 35 Hen. 8. in Copp'ces, or Under-woods fell'd at twenty four years growth, there were to be, left twelve standils, or stores of Oak, upon each Acre; in defect of so many Oaks, the same number of Elms, Ash, Alp, or Beech; and they to be such, as are of likely Trees for Timber, and of such as have been spar'd at some former Felling, unless there were none, in which case, they are to be then left, and so to continue without Felling, till they are ten inch square within a yard of ground. Copp'ces above this growth fell'd, to leave twelve great Oaks; or in defect of them, other Timber-trees (as above) and so to be left for twenty years longer, and to be enclosed seven years.

4. In sum, you are to spare as many likely Trees for Timber, as with discretion you can. And as to the Felling (beginning at one side, that the Carts may enter without detriment to what you leave standing) the Under-wood may be cut from January, at the latest, till mid-March or April; or from mid-September, till near the end of November; so as all be avoided by Midsummer at the latest, and then fenced (where the Rows, and brush lye longer unbound or made up, you endanger the loss of a second-Spring) and not to stay so long as usually they are a clearing, that the young, and the seedlings may suffer the least interruption: And if the Winter previous to your felling Copp'ces, you preserve them well from Catel, it will recompense your care.

5. It is advis'd not to cut off the brouse-wood of Oaks in Copp'ces, but to suffer it to fall off, as where Trees stand very close, it usually does: I do not well comprehend why yet it should be spar'd so long.

6. When you spy a cluster of Plants growing as it were all in a bunch, it shall suffice that you preserve the fairest sapling, cutting

ting all the rest away. And if it chance to be a *Chestnut, Service*, or like profitable Tree, clear it from the droppings, and incumbrances of other Trees, that it may thrive the better: Then, as you pass along, prune and trim-up all the young Wavers, covering such Roots as lie bare and expos'd, with fresh mould.

7. Cut not above half a foot from the Ground, nay the closer the better, and that to the South, slope-wise; Stripping up such as you spare from their extravagant branches, water-boughs, &c. that hinder the growth of others: Always remembering (before you so much as enter upon this work) to preserve sufficient Plash-pole about the verge and bounds of the Copp'ce for fence, and security of what you leave; and for this something less than a Rod may suffice: Then raking your Wood clear of Spray, Chips, and all incumbrances; shut it up from the Catel, the longer the better.

8. By the Statute, Men were bound to enclose Copp'ces after Felling, of, or under fourteen years growth, for four years: Those above fourteen years growth, to be sixteen years Enclos'd; And for Woods in common, a fourth part to be shut up; and at Felling, the like proportion of great Trees to be left, and seven years Enclos'd: This was enlarg'd by 13 Eliz. Your elder Under-woods may be graz'd about July: But for a general Rule, newly-weaned Calves are the least noxious to newly-cut Spring-woods, where there is abundance of Grass; and some say, Colts of a year old; but then the Calves must be driven out at May at farthest, though the Colts be permitted to stay a while longer: But of this, every every mans experience will direct him; and surely, the later you admit Beasts to graze, the better. For the Measure of Fuel, these proportions were to be observ'd.

9. Statutable Billet should hold three foot in length, and seven inch and half compass; ten or fourteen as they are counted for one, two, or three, &c. A Stack of Wood (which is the bough, and offal of the Tree to be converted to Char-coal) is four yards long, three foot and half high (in some places but a yard) and as much over: In other places, the Cord is four foot in height, and four foot overs; or (to speak more Geometrically) a Solid made up of three dimensions, four foot high, four foot broad, and eight foot long; the content 128 cubique feet. Fagots, ought to be a full yard in length, and two foot in circumference, made round, and not flat; for so they contain less Fuel, though equal in the bulk appearing. But of these particulars, when we come to speak expressly of Fuel.

10. In the mean time, it were to be wish'd, that some approv'd Experiments were sedulously try'd (with the advice of skilful, and ingenious Physicians) for the making of Beer without Hops; as possibly with the white Marrubium (a Plant of singular virtue) or with dry'd Heath-tops (viz. that sort which bears no berries) or the like, far more wholesome, and less bitter than either Tamarisk, Carduus, or Broom, which divers have essay'd; it might prove a means to save a world of Fuel, and in divers places young Timber, and Copp'ce-wood, which is yearly spent for Poles; especially, in Countries where Wood is very precious.

Note;

Note, that the *Wood-land-measure* by *Statute*, is computed after eighteen foot the *Perch*.

C H A P. XXIX.

Of Pruning.

Pruning. 1. **P**RUNING I call all purgation of *Trees* from what is superfluous. The *Ancients* found such benefit in *Pruning*, that they feigned a *Goddeſs* preſided over it, as *Arnobius* tells us: And in truth, it is in the diſcreet performance of this *work*, that the improvement of our *Timber*, and *Woods* does as much conſiſt as in any thing whatſoever. A ſkillful *Planter* ſhould therefore be early at this *Work*: Shall old *Gratius* give you *Reaſon* and *Direction*? And his *Interpreter* thus in *Engliſh*?

Twigs of themſelves never riſe ſtraight and high,
And Under-woods are bow'd as ſift the roſt.
Then prune the *Boughs*; and *Suckers* from the roſt
Diſcharge. The *leavy wood* ſoon piſt *tiro*.
After, when with tall rods the *Tree* aſpires,
And the round ſlaves to Heaven advance their twigs,
Pluck all the buds; and ſtrip off all the ſprigs;
Theſe iſſues vent what moiſture ſtill abound,
And the veins unemploy'd grow hard and found.

Nonquam ſponte ſua procerus ad atra terms
Exit, inque iſta curvantur ſilpe geſſite.
Ergo age luxuriam primo ſatijque nocentis
Dirale: frondolaſ gravat indulgentia ſilvas.
Poſt ubi proceris genioſe ſtipulis arbor
Se dedit, utriſque ſerent ad ſcabra virge,
Stringe mœas circum, & gemmantis exige verſus.
His, ſi quis vitium nocivum ſoſcepit humor,
Viſceribus ſuiſt, & venas durabit inerte.

waſt.

Gra. ſil.
Cynzer.

2. For 'tis a miſery to ſee how our faireſt *Trees* are defac'd, and mangl'd by unſkilful *Wood-men*, and miſchievous *Bordurers*, who go always arm'd with ſhort *Hand-bills*, hacking and chopping off all that comes in their way; by which our *Trees* are made full of *knots*, *boils*, *cankers*, and deform'd bunches, to their utter deſtruction: *Good Huſbands* ſhould be aſham'd of it; though I would have no *Wood-man* pretend to be without all his neceſſary *Furniture*, when he goes about this *work*; which I (once for all) reckon to be the *Hand-bill*, *Hatchet*, *Hook*, *Hand-ſaw*, an excellent *Pruning-Knife*, broad *Chizel* and *Mallet*, all made of the beſt *ſteel* and kept ſharp; And thus he is provided for greater, or more gentle *Executions*, *Purgations*, *Reciſions*, and *Coercions*; and it is of main concern, that the proper, and effectual *Tool* be applied to every *work*; ſince heavy, and rude *Inſtruments* do but mangle and bruise tender *Plants*; and if they be too ſmall, they cannot make clear, and even *work* upon great *arms* and *branches*: The *Knife* is for *Twigs* and *Sprays*; The *Chizel* for larger *Armes*, and ſuch *Amputations* as the *Ax* and *Bill* cannot well operate upon. As much to be reprehended are thoſe who either begin this *work* at unreaſonable times, or ſo maim the poor *branches*, that either out of lazineſs, or want of ſkill, they leave molt of them *ſtub*, and inſtead of cutting the *Arms* and *Branches* cloſe to the *bole*, hack them

them off a foot or two from the body of the *Tree*, by which means they become *hollow* and *rotten*, and are as ſo many *Conduits* to receive the *Rain* and the *Weather*, which conveys the wet to the very *Matrix* and *Heart*, deforming the whole *Tree* with many ugly *botches*, which ſhorten its life, and utterly marres the *Timber*: I know Sir H. *Platt* tells us, the *Elm* ſhould be ſo lopp'd, but he ſays it not of his own *Experience* as I do. And here it is that I am (once for all) to warn our diſorderly *Huſband-men* from coveting to let their *lops* grow to an extraordinary ſize, before they take them off, as conceiving it furniſhes them with the more wood for the fire; not conſidering, how ſuch gaily wounds mortally affect the whole Body of the *Tree*, or at leaſt does fo decay their vigour, that they hereby loſe more in one *Year*, than the *lop* amounts to, ſhould they pare them off ſooner, and when the *ſcars* might be cover'd: 'Tis true (as the induſtrious Mr. *Cook* obſerves) ſome trees, as the *Horn-beam*, &c. will bear conſiderable *lops*, when there's only the *ſhell* of the *Tree* ſtanding; but it is much to its detriment; eſpecially to the *Aſh*, which if once he come to take wet by this means, ſcarcely produces more *lop* to any purpoſe; above all, if it decay in the middle, when 'tis fitter for the *Chimney*, than to ſtand and cumber the ground: The ſame may be pronounc'd of moſt *Trees*, which would not perhaps become *dottards* in many ages, but for this covetous barbarity, and unſkilful handling.

3. By this *Animadverſion* alone it were eaſe for an ingenious man to underſtand how *Trees* are to be govern'd; which is in a word, by ſparing great *lops*, cutting clean, *ſmooth*, and *cloſe*, making the ſtroke upward, and with a ſharp *Bill*, ſo as the weight of an untractable *bough* do not *ſplice*, and carry the *bark* with it, which is both dangerous and unſightly. The *Oak* will ſuffer it ſelf to be made a *Polſard*, that is, to have its *Head* quite cut off; but the *Elm* ſo treated, will periſh to the *foot*, and certainly become hollow at laſt, if it ſcape with *life*.

4. The proper ſeaſon for this *work* is for old *Trees* earlier, for young *later*, as a little after the change in *January* or *February*, ſome ſay in *December*, the *Wind* in a gentle quarter:

Then ſhove their locks, and cut their branchy treſs
Sever'd now, luxuriant boughs reſpects;

—Tunc ſtränge comas, tunc brachia tendit:
—Tunc denique duæ
Exercent Imperia, & ramos compoſite ſilentiſ.
Georg. 2.

But this ought not to be too much in young *Fruit-trees*, after they once come to form a handſome *head*; in which period you ſhould but only pare them over about *March*, to cover the *ſtock* the ſooner, if the *Tree* be very choice: To the aged, this is plainly a renewing of their *Youth*, and an extraordinary reſreſhment, if taken in *time*, and that their *Arms* be not ſuffer'd to grow too great and large; in which caſe, the member muſt not be amputated too near the body, but at ſome diſtance — ne pars ſincera trahatur: and remember to cut ſmooth, and ſloping upwards if upright boughs, otherwiſe downward; and be ſure to emplaſter great wounds to keep out the wet, and haſten the covering of the bark: Beſides, for

for *Interlucation*, exuberant branches, & *Spisse nemorum* come, where the boughs grow too thick and are cumbersome, to let in the sun and Air, this is of great importance; and so is the sedulous taking away of *Suckers*, *Water-boughs*, *Fretters*, &c. And for the benefit of tall Timber, the due *stripping up* the branches, and *rubbing off* the buds to the heights you require: Yet some do totally forbear the *Oak*, especially if aged, observing that they much exceed in growth such as are pruned; and in truth such Trees as we would leave for *shade*, and ornament, should be seldom cut; but the *browse-mood* cherish'd, and preserv'd as low towards the Ground as may be, for a more venerable and solemn *shade*: and therefore I did much prefer the *Walk of Elms* at St. James's Park, as it lately grew *branchy*, intermingling their reverend tresses, before the present trimming them up to high; especially, since I fear, the remedy comes too late to save their decay, if the amputations of such overgrown parts as have been cut off, should not rather accelerate it, by exposing their large, and many wounds to the injuries of the weather, which will endanger the rotting of them, beyond all that can be apply'd by *Tar*, or otherwise to protect them: I do rather conceive their Infirmities to proceed from what has not long since been abated of their large spreading Branches, to accommodate with the *Mall*; as any one may conjecture by the great impression which the *wet* has already made in those incurable scars, that being now multiplied, must needs the sooner impair them; Their roots having likewise infinitely suffer'd, by many disturbances about them. In all events this *Walk* might have enjoy'd its goodly Canopy with all their branchy furniture for some Ages to come; since 'tis hardly one, that first they were planted: But his Majesty will have providently, and nobly supplied this defect, by their successors of *Lime-trees*, which will sooner accomplish their perfection.

One should be cautious in heading *Timber-trees*, especially the *pitchy*; unless where they grow very crooked, in which case abate the head with an upward sloop, and cherish a leading shoot: The *Beech* is very tender of its head.

It is by the discreet leaving the *side-boughs* in convenient places, sparing the smaller, and taking away the bigger, that you may advance a Tree to what determin'd height you desire: Thus, bring up the *leader*, and when you would have that spread and break out, cut off all the *side-boughs*, and especially at *Midsummer*, if you espie them breaking out. Young trees may every year be pruned, and as they grow older at longer intervals, as at three, five, seven or sooner, that the wounds may recover, and nothing be deform'd.

Ever-Greens do not well support to be decapitated; side-boughs they freely spare in *April*, and during the *Spring*; and if you cut at first two or three Inches from the body, and the next *Spring* after, close to the stem, covering it with *Wax*, or well temper'd clay, the most tender may suffer such amputations without prejudice.

5. Divers other precepts of this nature I could here enumerate, had not the great experience, faithful, and accurate description how this

this

this necessary work is to be perform'd, set down by our Countryman honest *Lawson* (*Orchard*, cap. 11.) prevented all that the most *Inquisitive* can suggest: The particulars are so ingenious, and highly material, that you will not be displeas'd to read them in his own style, and *Character*.

All ages (saith he) by Rules and experience do consent to a pruning, and lopping of Trees: Yet have not any that I know described unto us (except in *Dark*, and general words) what, or which are those superfluous boughs, which we must take away; and that is the most chief, and most needful point to be known in lopping. And we may well assure our selves (as in all other Arts, so in this) there is a bantage and dexterity by skill; an habit by practice out of experience, in the performance hereof, for the profit of mankind: Yet do I not know (let me speak it with patience of our cunning Arborists) any thing within the compass of humane affairs so necessary, and so little regarded: not only in Orchards, but also in all other Timber-trees, where or whatsoever.

Now to our purpose:

How many Forests, and Woods, wherein you shall have for one likely thriving Tree, four (nay sometimes twenty four) evil thriving, rotten and dying Trees, even whilst they live and instead of Trees, thousands of bushes and shrubs! what rottenness! what hollowedness! what dead arms! wither'd tops! curtail'd trunks! what loads of Moss! browning boughs! and dying branches shall you see every where! and those that in this sort are in a manner all unprofitable boughs, canker'd arms, crooked, little and short boals. What an infinite number of *Bushes*, *Shrubs*, and *Skraggs* of *Hazels*, *Thorns*, and other unprofitable wood, which might be brought by dressing to become great, and goodly Trees! Consider now the Cause.

The lesser Wood hath been spoil'd with careless, unskilful, and untimely felling; and much also of the great Wood. The greater Trees at the first rising have all'd and overladen themselves with a number of wasteful boughs and suckers, which have not only drawn the sap from the boal, but also have made it knotty, and themselves, and the boal mossie, for want of dressing; whereas, if in the prime of growth, they had been taken away close, all but one top, and clean by the bulk, the strength of all the sap should have gone to the bulk, and so be would have recovered, and cover'd his knots, and have put forth a fair, long, and straight body, for Timber profitable, huge great of bulk, and of infinite use.

If all Timber-trees were such (will some say) how should we have crooked wood for *Wheels*, *Coorbs*, &c?

Ans. Dress all you can, and there will be enough crooked for those uses.

Better than this, in most places they grow so thick, that neither themselves,

themselves, nor earth, nor any thing under or near them can abide; nor Sun, nor Rain, nor Air can do them, nor any thing near, or under them, any profit or comfort.

I see a number of Hags, where out of one root you shall see three or four (nay more, such is mens unskilful greediness, who desiring many, have none good) pretty Oaks, or Alhes freight and tall: because the root at the first shoot gives sap again: But if one only of them might be suffer'd to grow, and that well, and cleanly prun'd, all to his very top, what a Tree should we have in time? And we see by those roots continually, and plentifully springing, notwithstanding to deadly wounded, what a Commodity should arise to the Owner, and the Commonwealth if wood were cherish'd, and orderly dress'd. The waste boughs closely, and skilfully taken away, would give us store of Fences and Fuel; and the bulk of the Tree in time would grow of huge length and bigness: But here (methinks) I hear an unskilful Arbonist say, that Trees have their several forms, even by Nature; the Pear, the Holly, the Aspe, &c. grow long in bulk, with few and little Arms. The Oak by nature broad, and such like. All this I grant: But grant me also, that there is a profitable end and use of every Tree, from which if it decline (though by nature) yet Man by Art may (nay must) correct it. Now other end of Trees I never could learn, than good Timber, Fruit much and good, and pleasure: Bless Physical hinder nothing a good form.

Neither let any Man ever so much as think, that it is unprofitable, much less impossible, to reform any Tree of what kind soever: For (believe me) I have tried it: I can bring any Tree (beginning betime) to any form. The Pear, and Holly may be made spread, and the Oak to close.

Thus far the good Man out of his eight and forty years experience concerning Timber-trees: He descends then to the Orchards; which because it may likewise be acceptable to our industrious Planter, I thus contract.

6. Such as stand for Fruits should be parted from within two foot (or thereabouts) of the earth; so high, as to give liberty to dress the Root, and no higher; because of exhausting the sap that should feed his Fruit: For the bowl will be first, and best served and fed, being next to the root, and of greatest substance. These should be parted into two, three, or four Arms, as your grass yield twigs; and every Arm into two, or more Branches, every Branch into his several Cyons: still spreading by equal degrees; so as his lowest spray be hardly without the reach of a mans hand, and his highest not past two yards higher: That no twig (especially in the midst) touch his fellow; let him spread as far as his list without any master-bough, or top, equally; and when any fall lower than his fellows (as they will with weight of Fruit) ease him the next spring of his superfluous twig, and he will rise: When any mount above the rest, top him with a nip between your fingers, or with a knife:

Thus

Thus reform any Cyon; and, as your Tree grows in stature, and strength, so let him rise with his tops, but slowly, and easily; especially in the midst, and equally in breadth also; following him upward, with lopping his under-growth, and water-boughs, keeping the same distance of two yards, not above three, in any wise, betwixt the lowest and highest twigs.

1. Thus shall you have hardy, clear, healthful, great and lasting Trees.

2. Thus will they grow safe from Winds, yet the top spreading.

3. Thus shall they bear much Fruit; I dare say, one as much as five of your common Trees, all his branches laden.

4. Thus shall your Bowl being low, defraud the branches but little of their sap.

5. Thus shall your Trees be easie to dress, and as easie to gather the Fruit from, without bruising the Cyons, &c.

6. The fittest time of the Moon for the Pruning is (as of Grassing) when the sap is ready to stir (not proudly stirring) and so to cover the wound; and here, for the time of day, we may take Columella: *Frondem medio die arborator ne cadito*, l. 1. 11. Old Trees would be prun'd before young Plants: And note, that wheresoever you take any thing away, the sap the next Summer will be putting; be sure therefore when he puts to bud in any unfit place, you rub it off with your finger; and if this be done for three, or four years till at Midsummer, it will at last wholly clear the side-boughs, and exalt the growth of the stem exceedingly; and this is of good use for Elms, and such Trees as are continually putting forth where they have been prun'd: Thus begin timely with your Trees; and you may bring them to what form you please. If you desire any Tree should be taller, let him break; or divide higher: This, for young Trees: The old are reformed by curing of their diseases, of which we have already discours'd. There is this only to be consider'd, in reference to Foresters, out of what he has spoken concerning Fruit-trees; that (as has been touch'd) where Trees are planted for shadow, and meet ornament; as in Walks, and Avenues, the Brow-wood (as they call it) should most of it be cherish'd; whereas in Fruit, and Timber-trees (Oak excepted) it is best to free them of it: As for Pollards (to which I am no great friend, because it makes so many snags, and dwarfs of many Trees which would else be good Timber, endangering them with drips and the like injuries) they should not be headed above once in ten or twelve years, at the beginning of the Spring, or end of the Fall. And note, that all Coppicing, and cutting close, invigorates the Roots and the Stem of whatsoever grows weak and unkindly; but you must then take care it be not overgrown with Weeds or Grass: Nothing (says my Lord Bacon Exp. 386. and truly) causes Trees to last so long, as the frequent Cutting; every such diminution being a re-invigoration of the Plants juices; so that it neither goes too far, nor rises too faintly, as when 'tis not timely refresh'd with this Remedy; and therefore we see, that the most ancient Trees in Church-Yards, and

about *Old Buildings*, are either *Pollards* or *Dottards*, seldom arising to their full altitude.

7. For the improvement of the speedy growth of *Trees*, there is not a more excellent thing than the frequent *rubbing* of the *Boal* or *Stem*, with some piece of *hair-cloth*, or ruder stuff, at the beginning of *Spring*: some I have known done with *Seals-skin*; the more rugged bark with a piece of *Coat of Mail*, which is made of small *myers*; This done, when the body of the *Trees* are wet, as after a soaking *Rain*; yet so, as not to *excorticate*, or gall the *Tree*, has exceedingly accelerated its growth, (I am assured, to a wonderful and incredible improvement) by opening the *pores*, freeing them of *moss*, and killing the *worm*.

8. Lastly, *Fronddation*, or the taking off some of the luxuriant *branches*, and *sprays*, of such *Trees*, especially whose leaves are profitable for *Castel* (whereof already) is a kind of *pruning*: and so is the *scarifying*, and cross *hatching* of some *Fruit-bearers*, and others, to abate that *πονοκακία* which spends all the *juice* in the *leaves*, to the prejudice of the rest of the parts.

9. This, and the like, belonging to the *care* of the *Wood-ward*, will mind him of his continual duty; which is to walk about, and survey his young *Plantations* daily; and to see that all *Gaps* be immediately stopp'd; trespassing *Cattle* impounded; and (where they are infested) the *Deer* chased out, &c. It is most certain, that *Trees* preserv'd, and govern'd by this *discipline*, and according to the *Rules* mention'd, would increase the beauty of *Forests*, and value of *Timber*, more in ten, or twelve years, than all other imaginable *Plantations* (accompanied with our usual neglect) can do in forty or fifty.

10. To conclude, in the time of this *Work* would our ingenious *Arborator* frequently *incorporate*, mingle, and unite the *Arms* and *Branches* of some young, and flexible *Trees* which grow in *confort*, and near to one another; by entering them into their mutual *barks* with a convenient *infition*: This, especially, about *Fields*, and *Hedge-rows* for *Fence* and *Ornament*: Dr. Plot mentions some that do *naturally*, or rather indeed *accidentally* mingle thus; especially the two *Beeches* in the way from *Oxford* to *Reading* at *Cain-end*; the bodies of which *Trees* springing from different *roots*, after they have ascended parallel, to the *Top*, strangely unite together a great height from the ground, a transverse piece of timber entering at each end the bodies of the *Trees*, and growing jointly with them: The same is seen in *Sycamores* at *New-College Gardens*: I my self have woven young *Ash-poles* into twigs of three, and four braids like *Womens* hair when they make it up to *fillets* it under their *Coifes*, which have strangely incorporated and grown together without separation.

Trees will likewise grow frequently out of the *boal* of the other, and some roots will penetrate through the whole length of the *Trunk*, till fastning in the very *Earth*, they burst the including *Tree*, as it has happened in *Willows*, where an *Ash-Tree* has sprung likely from some *key* or *seed* dropt upon the rotten head of it: But

this

this accident not so properly pertaining to this *Chapter*, I conclude with recommending the bowing and bending of young *Timber-Trees*, especially *Oak* and *Ash*, into various *flexures*, *curbs* and *postures*, oblig'd to ply themselves into different *Modes*, which may be done by humbling, and binding them down with tough *bands* and *withs*, or *books*; rather, cut *skew-wise*, or slightly *bagled* and indented with a *knife*, and so *skewed* into the ground, or hanging of weighty stones to the tops, or branches, till the *tenor* of the *sap*, and custom of being so constrain'd, did render them apt to grow so of themselves, without power of redressing; This course would wonderfully accommodate Materials for *Knee-timber* and *Shipping*, the *Wheel-wright* and other uses; conform it to their *Moulds*, and save infinite labour, and abbreviate the work of *bowing* and *waste*,

— *adso in teneris consuescere multum est.*

and the *Poet*, it seems, knew it well, and for what purposes,

When in the woods with mighty force they bow
The Elm, and shape it to a crooked plow.

Continuè in Sylvis magna vi flexa domatur
In bivio, & curvis formam accipit Unius arati.
Geoa. 1.

so as it even half made it to their hands.

C H A P. XXX.

Of the Age, Stature, and Felling of Trees.

1. **I**T is not till a *Tree* is arriv'd to his perfect *Age*, and full vigor, *Felling* that the *Lord* of the *Forest* should consult, or determine concerning a *Felling*. For there is certainly in *Trees* (as in all things else) a time of *Increment*, or growth; a *Status* or season when they are at *best* (which is also that of *Felling*) and a *decrement* or period when they decay. To the *first* of these they proceed with more, or less *velocity*, as they consist of more strict and compacted *particlers*, or are of a *slighter*, and more lax *contexture*; by which they receive a *speedier*, or slower *defluxion* of *Aliment*: This is apparent in *Box*, and *Willow*; the one of a harder, the other of a more tender *substance*: But as they proceed, so they likewise continue. By the *state* of *Trees* I would signify their utmost *effort*, growth, and maturity, which are all of them different as to *time*, and *kind*; yet do not I intend by this any *period* or instant in which they do not continually either *improve* or *decay* (the end of one being still the beginning of the other) but farther than which, their *Natures* do not extend; but immediately (though to our senses imperceptibly) through some *infirmary* (to which all things sublimary

sublunary be obnoxious) dwindle and impair, either through *Age*, defect of *Nourishment*, by *sickness*, and decay of principal parts; but especially, and more inevitably, when violently invaded by mortal and incurable *Infirmities*, or by what other extinction of their *vegetative heat*, *subtraction*, or *obstruction of Air* and *Moisture*, which making all *motions* whatsoever to cease and determine, is the cause of their final destruction.

2. Our honest *Country-man*, to whose *Experience* we have been obliged for something I have lately *Animadverted* concerning the *Pruning of Trees*, does in another *Chapter* of the same *Treatise*, speak of the *Age* of Trees. The *Discourse* is both learned, rational, and full of encouragement: For he does not scruple to affirm, that even some *Fruit-Trees* may possibly arrive to a *thousand years of Age*; and if so *Fruit-Trees*, whose continual bearing does so much impair, and shorten their lives, as we see it does their form and beauty; How much longer might we reasonably imagine some *hardy* and flow-growing *Forest-trees* may probably last; I remember *Pliny* tells us of some *Oaks* growing in his time in the * *Hercynian Forest*, which were thought *co-evals* with the *World* it self; their roots had even raised *Mountains*, and where they encounter'd, swell'd into goodly *Arches* like the *Gates* of a *City*: But our more modern *Author's* calculation for *Fruit-trees* (I suppose he means *Pears*, *Apples*, &c.) his allowance is *three hundred years for growth*, as much for their *stand* (as he terms it, and *three hundred for their Decay*, which does in the total amount to no less than *nine hundred years*. This conjecture is deduc'd from *Apple-Trees* growing in his *Orchard*, which having known for *forty years*, and upon diligent enquiry of sundry aged Persons of eighty years and more, who remembred them *Trees* all their time, he finds by comparing their growth with others of that *kind*, to be far short in bigness and perfection, (*viz.* by more than two parts of three) yea albeit those other *Trees* have been much hindered in their stature, through ill government and mis-ordering: And this to me seems not at all extravagant, since I find mention of a *Pear-tree* near *Ross* in *Heresfordshire*, which being of no less than *18 feet in circumference*, and yielding seven *Hogs-heads* of *Cider* yearly, must needs have been of very long standing and age, though perhaps not so near *Methuselah's*.

3. To establish this, he assembles many *Arguments* from the age of *Animals*, whose *state* and *decay* double the time of their increase by the same proportion: If then (saith he) these frail Creatures, whose bodies are nothing (in a manner) but a tender *rottenness*, may live to that age; I see not but a *Tree* of a solid substance, not diminished by heat or cold, capable of, and subject to any kind of ordering or dressing, feeding naturally, and from the beginning disburthen'd of all superfluities; eased of, and of his own accord avoiding the causes that may annoy him, should double the life of other Creatures by very many years. He proceeds, What else are *Trees* in comparison with the Earth, but as hairs to the body of Man? And it is certain, that (without some distemper,

* Hercynia
Sylva robur
vastitas intus
levis, & con-
genita mundo,
prope immortalis
forte miracula
excedit. Plin.
l. 16. c. 2.

distemper, or forcible cause) the hairs *dare* with the body, and are esteem'd excrements but from their *superfluous growth*: So as he resolves upon good Reason, that *Fruit-trees* well ordered, may live a *thousand years*, and bear *Fruit*; and the longer the more, the greater, and the better (for which an Instance also in Dr. Beal's *Heresfordshire Orchards*, pag. 21, 22.) because his vigour is proud and stronger, when his years are many. Thus shall you see *old Trees* put forth their *Buds* and *Blossoms* both sooner, and more plentifully than *young Trees* by much; And I sensibly perceive (saith he) my *young Trees* to enlarge their *Fruit* as they grow greater, &c. And if *Fruit-Trees* continue to this *Age*, how many *Ages* is it to be supposed strong, and huge *Timber-trees* will last? whose massive bodies require the years of divers *Methuselah's* before they determine their days; whose *Sap* is strong and bitter; whose *Bark* is hard and thick, and their substance solid and stiff; all which are defences of health and long life. Their strength withstands all forceable *Winds*; their *Sap* of that quality is not subject to *Worms* and tainting; their *Bark* receives seldom or never by casualty any wound; and not only so, but he is free from *Removals*, which are the death of *millions of Trees*; whereas the *Fruit-tree* (in comparison) is little, and frequently blown down; his *Sap* sweet, easily and soon tainted; his *Bark* tender, and soon wounded; and himself used by *Man*, as *Man* uses himself; that is, either *unskillfully*, or *carelessly*. Thus he. But *Vossius de Theolog. Gent. l. 5. c. 3.* gives too little age to *Asher*, when he speaks but of one *hundred years* (in which, as in the rest, he seems to agree with my Lord Bacon, *Hist. Vite & Mort. Artic. 1.*) and to the *Medica*, *Pyrus*, *Prunus*, *Cornus* but *sixty*; he had as good have held his peace: Even *Rosemary* has lasted amongst us a hundred years.

4. I might to this add much more, and truly with sufficient probability, that the *Age of Timber-trees*, especially of such as be of a compact, resinous, or balsamical nature (for of this kind are the *Tew*, *Box*, *Horn-beam*, *White-thorn*, *Oak*, *Walnut*, *Cedar*, *Juniper*, &c.) are capable of very long duration and continuance: Those of largest *Roots* (a sign of *Age*) longer liv'd than the *shorter*; the *dry* than the *wet*; and the *gummy*, than the *watery*, *sterile*, than the *fruitful*: For not to conclude from *Pliny's* * *Hercynian Oaks*, or the *Turpentine Tree* of *Idumaea*, (which *Josephus* ranks also with the *Creation* :) I mention'd a *Cypress* yet remaining somewhere in *Persia* near an old *Sepulchre*, whose *stem* is as large as *five men* can compass, the boughs extending fifteen paces every way; this must needs be a very old *Tree*, believ'd by my *Author* little less than *2500 years of age*: The particulars were too long to recount. The old *Platanus* set by *Agamemnon*, mention'd by *Theophrastus*, and the *Herculean Oaks*; the *Laurel* near *Hippocrene*, the *Pasican Ilex*, the *Vine* which was grown to that bulk and *Woodiness*, as to make *Columns* in *Juno's Temple*, and such another in *Margian* is spoken of by *Strabo*, that was twelve foot in circumference: *Pliny* mentions one of six hundred years old in his time; and

* Sylvarum;
Hercynia diu-
rum sexaginta
iter occupans,
et major aliis;
ita & maior.
Pomp. Met.
l. 3. c. 3.

and at *Ecoan* the late Duke of *Montmorancys* house, is a *Table* of a very large dimension made of the like plant. And the old *Lotus* Trees, recorded by *Valerius Maximus*, and the *Quercus Mariana* celebrated by that Prince of Orators: *Plinies* huge *Larix*, and what grew in the *Fortunate Islands*, with that enormous *Tree* *Scaliger* reports was growing in the *Troglodytic India*, &c. were famous for their age: *St. Hierom* affirms he saw the *Sycamor* that *Zaccheus* climb'd up, to behold our *LORD* ride in Triumph to *Jerusalem*: And now in the *Aventine Mount* they shew us the *Malus Medica*, planted by the hand of *St. Dominic*: In *Congo* they speak of *Trees* capable to be excavated into *Vessels* that would contain two hundred men a piece. To which add those superannuated *Tilia's* now at *Basil*, and that of *Ausburg*, under whose prodigious *shade* they so often *feast*, and celebrate their *Weddings*; because they are all of them noted for their reverend *Antiquity*; for to such *Trees* it seems they paid *Divine* honours, as the nearest *Emblems* of Eternity, & *tantum sacros ex vetustate*, as *Quintilian* speaks: And like to these might that *Cypress* be, which is celebrated by *Virgil*, near to another Monument.

5. But we will spare our *Reader*, and refer him that has a desire to multiply examples of this kind, to those undoubted *Records* our *Naturalist* mentions in his 44. *Chap. Lib. 16.* where he shall read of *Scipio Africanus's* Olive-Trees; *Diana's Lotus*; the *Ruminal* Fig-tree lasting (as *Tacitus* calculated) 840 years: The *Ilex*, of prodigious antiquity, as the *Hetruscan* Inscription remaining on it imported; But *Pausanias* in his *Arcadics*, thinks the *Samian Virex* (of which already) to be one of the oldest Trees growing, and the *Platan* set by *Menelaus*; to these he adds the *Dolian Palm*, covetous with *Apollo* himself; and the *Olive* planted by *Minerva* according to their tradition; the over-grown *Myrtil*; the *Vatican Holm*, those of *Tyburine*, and especially, that near to *Tusculum*, whose body was thirty five foot about; besides divers others which he there enumerates in a large *Chapter*: And what shall we conjecture of the age of *Xerxes's* huge *Platanus*, in admiration whereof he said the march of so many hundred thousand men for so many days, by which the wife *Socrates* was us'd to *swear*? And certainly, a goodly *Tree* was a powerful attractive, when that prudent *Consul, Passienus Crispus* fell in love with a prodigious *Beech* of a wonderful age and stature, and that wise Prince *Francis the first*, with an huge *Oak*, which he caus'd to be so curiously immur'd at *Bituriges*.

6. We have already made mention of *Tiberius's Larch*, employ'd about the *Naumachia*, which being of one hundred and twenty foot in length, bare two foot diameter all that space, not counting the top: To this might be added the *Mast* of *Demetrius's Galeasse*, which consisted but of one *Cedar*. And that of the *Float* which waisted *Caligulas Obelisks* out of *Egypt*, four fathoms in circumference: We read also of a *Cedar* growing in the *Island of Cyprus*, which was 130 foot long, and 18 in diameter; of the *Plane* in *Athens*, whose roots extended 36 Cubits farther than the boughs, which

which were yet exceedingly large; and such another was that most famous *Tree* at *Veliternus*, whose arms stretch'd out 80 foot from the stem: But these were *solid*: Now if we will calculate from the hollow, besides those mention'd by *Pliny*, in the *Hercynian Forest*; the *Germans* (as now the *Indians*) had of old some *Punti*, or *Canoes* of excavated *Oak*, which would well contain thirty, some forty persons: And the *Lician Platanus* recorded by the *Naturalist*, and remaining long after his days, had a room in it of eighty one feet in compass, adorn'd with *Fountains*, stately *Seats*, and *Tables* of stone; for it seems it was so glorious a *Tree* both in body, and head, that *Licinius Mutianus* (three times *Consul*, and Governour of that *Province*) us'd to feast his whole *Retinue* in it, chusing rather to lodge in it, than in his golden-roofed *Palace*: And of later date, that vast *Cerrus* in which an *Eremit* built his *Cell* and *Chappel*, so celebrated by the noble *Crassus* in his *Poem Malteide. Cant. 8. Stro. 30.*

But for these capacious hollow-trees we need go no farther than our own *Country*; there being (besides that which I mention in *Gloucestershire* an *Oak* at *Kidlington-green* in *Oxfordshire*, which has been frequently us'd (before the death of the late Judge *Morton*, near whose house it stood) for the immediate imprisonment of *Vagabonds* and *Malefactors*, till they could conveniently be remov'd to the County *Gaol*; And such another *Prison* Dr. *Plot* does in his excellent *History of Oxfordshire*, mention out of *Ferdinand Hertado* in *Moravia*, to be made out of the *Trunk* of a *Willow*, 27 foot in compass: But not to go out of our promis'd bounds, the learned *Doctor* speaks of an *Elm* growing on *Blechington-green*, which gave reception and harbour to a poor great-bell'd *Woman*, (whom the unhospitable people would not receive into their houses) who was brought to bed in it of a *Son*, now a lusty young fellow: These, with our *Historian*, I rather mention also for their extravagant use, and to refresh the *Reader* with some variety, than for their extraordinary capacity; because such instances are innumerable, should we pretend to illustrate this particular with more than needs.

And now I have spoken of *Elms* and other extravagancies of *Trees*; There stands one (as this curious Observer notes) in *Binsley* Common, six yards diameter next the ground, which 'tis conjectur'd has been so improv'd by raising an earthen bank, or seat about it, which has caus'd it to be put forth into *spurs*; it not being so considerable in the higher *Trunk*.

7. Compare me then with these, that nine fathom'd-deep *Tree* spoken of by *Josephus* at *Costa*; the *Mastick-tree* seen, and measur'd by Sir *Francis Drake*, which was four and thirty yards in circuit; Those of *Nicaragua* and *Gambra*, which 17. persons could hardly embrace. In *India*, (says *Pliny*) *Arbores tantæ proceritatis traduntur, ut sagittis superari nequeant* (and adds, which I think material, and therefore add also) *Hæc facit ubertas soli, temperies cæli, & Aquarum abundantia*. Such were those *Trees* in *Corsica*, and near *Memphis*, &c. recorded by *Theophrastus*, &c. and for prodigious height, the two, and three hundred foot unparallel'd

Palms-royal describ'd by Captain *Ligon*, growing in our *Plantations* of the *Barbados*; or those goodly *Majis* of *Fir*, which I have seen, and measur'd, brought from *New-England*; and what *Bombus* relates of those *twenty-fathom'd Antarctic-Trees*; or those of which *Cardan* writes, call'd *Ciba*, which rising in their several *Stems* each of *twenty foot* in compals, and as far distant each from other, unite in the *bole* at *fifteen foot* height from the ground, composing *three* stately *Arches*, and thence ascending in a *shaft* of prodigious bulk and altitude; Such *Trees* of *37 foot diameter* (an incredible thing) *Scaliger* (his *Antagonist*) speaks of *ad Gambræ fluvium*. *Matthioli* mentions a *Tree* growing in the *Island* of *Cyprus*, which contain'd *130 foot* high found *Timber*: And upon *Mount Atna* in *Sicily* is a place call'd by them *gli Castagne* from three *Chestnut-trees* there standing, where in the cavity of one yet remaining, a considerable *Flock* of *Sheep* is commonly fold'd: *Kerchers* words are these, as seen by himself, *Et quod forsitan &c. &c. videri possit, offendit mihi vis dux, unius Castaneæ Corticem tanta amplitudine, ut intra eam integer pecorum grex à pastoribus, tanquam in Caula commodissima, noctu includetur. China Illustr. p. 185.* But this, as I remember, was lately ruin'd by the direful conflagration about *Catanea*: And what may we conceive of those *Trees* in the *Indies*, one of whose *Nuts* hardly one man is able to carry; and which are so vast, as they depend not like other *Fruit*, by a *Stalk* from the boughs, but are produc'd out of the very body, and *stem* of the *Tree*, and are sufficient to feed twenty persons at a *meal*? There were *Trees* found in *Brazeele*, that sixteen Men could hardly fathom about, and the *Jesuits* caused one of these to be fell'd, for being superstitiously worship'd by the *Savages*, which was *120 foot* in circumference. The *Mexican* Emperour is said to have had a *Tree* in his *Garden*, under whose shade a thousand men might sit at a competent distance.

We read of a certain *Fig* in the *Caribby Islands*, which emits such large buttresses, that great *Planks* for *Tables* and *Flooring* are cleft out of them, without the least prejudice to the *Tree*; and that one of these does easily shelter 200 men under them: *Strabo*, I remember, *Geog. l. 15.* talks of fifty Horsemen under a *Tree* in *India*; his words are *ὅσῃ τῇ ἐν δένδρῳ περικελευμένη στρατοῦς ὑπὸ τῆς σκιάς περιεστέλλεται*, and of another that shaded five *stadia* at once; and in another place of a *Pine* about *Ida*, which measur'd 24 foot diameter, and of a monstrous height: To these may be added the *Arbor de Rays*, a certain *Tree* growing in the *East-Indies*, which propagates it self into a vast *Forest* (if not hinder'd) by shooting up, and then letting a kind of gummy string to fall and drivel from its branches, which takes root in the ground again, and in this process spread a vast circuit; the single item of some of which are reported to be no less than fifty foot diameter, a thing almost incredible: But even this and all we have hitherto produc'd, is nothing to what I find mention'd in the late *Chinese History* (as 'tis set forth upon occasion of the *Dutch Embassy*) where they tell us of a certain *Tree* call'd *Ciennich* (or the *Tree* of a thousand years) in the Province

Province of *Suchu* near the City *Kien*, which is so prodigiously large, as to throwd 200 *Sheep* under one only *branch* of it, without being so much as perceiv'd by those who approach it. And to conclude with yet a greater wonder, of another in the Province of *Chekiang*, whose amplitude is so stupendiously vast, as *four score* persons can hardly embrace: not to omit the strange, and incredible bulk of some *Oaks* standing lately in *Westphalia*, whereof one serv'd both for a *Castle* and *Fort*, and another there which contain'd in height 130 foot, and (as some report) 30 foot diameter: I have read of a *Table* of *Walnut-tree* to be seen at *St. Nicholas's* in *Lorraine*, which held 25 foot broad, all of a *piece*, and of competent length and thicknes, rarely *fleck'd* and *watered*; *Scamozzi* the *Architect* reports he saw it: Such a monster, that might be, under which the *Emperour Fred.* the third held his magnificent *Feast* 1472. For in this *recension* we will endeavour to give a taste of more fresh observations, and to compare our modern *Timber* with the *Antient*, and that, not only abroad, but without travelling into foreign Countries for these wonders.

8. What goodly *Trees* were of old ador'd, and consecrated by the *Dryads* I leave to conjecture from the stories of our ancient *Britains*, who had they left *Records* of their prodigies in this kind, would doubtless have furnish'd us with examples as remarkable for the growth and stature of *Trees*, as any which we have deduc'd from the *Writers* of foreign Countries; since the remains of what are yet in being (notwithstanding the havock which has universally been made, and the little care to improve our woods) may stand in fair competition with any thing that *Antiquity* can produce.

9. There is somewhere in *Wales* an *Inscription* extant, cut into the wood of an old *Beam*, thus,

SEXAGINTA PEDES FUERANT IN STIPITE NOSTRO,
EXCEPTA COMA QUÆ SPECIOSA FUIT.

This must needs have been a noble *Tree*, but not without later *parallels*; for to instance in the several *species*, and speak first of the bulks of some immense *Trees*; there was standing an old and decay'd *Chestnut* at *Fraiting* in *Essex*, whose very stump did yield thirty fizable load of *Logs*; I could produce you another of the same kind in *Gloucestershire* which contains within the bowels of it a pretty wain-scotted Room inlighten'd with windows, and furnish'd with seats, &c. to answer the *Lician Platanus* lately mention'd.

10. But whilst I am on this period; see what a *Tilia* that most learn'd, and obliging person Sir *Tho. Brown* of *Norwich*, describes to me in a *Letter* just now receiv'd.

An extraordinary large, and stately *Tilia*, Linden or Lime-tree, there groweth at *Depeham* in *Norfolk*, ten miles from *Norwich*, whose measure is this. The compass in the least part of the Trunk or body about two yards from the ground, is at least eight yards and half: about the root nigh the earth, sixteen yards, about half

a yard above that, near twelve yards in circuit: The height to the uppermost boughs about thirty yards, which surmounts the famous Tilia of Zurich in Switzerland; and uncertain it is whether in any Tilicetum, or Lime-walk abroad it be considerably exceeded: Tet was the first motive I had to view it not so much the largeness of the Tree, as the general opinion that no man could ever name it; but I found it to be a Tilia foemina; and (if the distinction of Bauhinus be admitted from the greater, and lesser leaf) a Tilia Platyphyllos or Latifolia; some leaves being three inches broad; but to distinguish it from others in the Country, I call'd it Tilia Colossia Depehamensis. Thus that learned person.

A Poplar-tree not much inferior to this he informs me grew lately at Harlingly Thetford, at Sir William Gawdies gate, blown down by that terrible Hurrican about four years since.

But here does properly intervene that prodigious Tilia of Newstadt in the Dutchy of Wirtemberg, so famous for its monstrosity, that even the City it self receives a denomination from it, being call'd by the Germans Neustadt under groffen Linden, or Newstadt by the great Lime-tree. The circumference of the Trunk is 27 foot 4 fingers: The Ambitus or extent of the boughs 403 ferè; the diameter from South to North 14½, from East to West 119 foot; set about with divers Columns and Monuments of Stone (82 in number at present, and formerly above an hundred more) which several Princes, and noble Persons have adorn'd, and celebrated with Inscriptions, Arms, and Devices, and which, as so many Pillars, serve likewise to support the umbragious and venerable boughs: And that even the Tree had been much ampler, the Ruines, and distances of the Columns declare, which the rude Souldiers have greatly impair'd.

By the Date of the ancientst Columns yet intire, namely Anno 1555. may be conjectur'd how goodly a Tree it was above an hundred and twenty years since. The Inscriptions on the several Arms and Supporters are as follows.

D. V. H. Z. W. CLL-----Graff zu Leuchtenberg. 1591. 1583. 1575. Albert von Rosenberg Ritter. 1591. Wolff Keidel alter Furulentum. 1555. Some report he planted it. Hans Heinric vonder Tana. 1583. Conrad von Flbeg. 1575. Friz Nerter von Herteneh. 1575. Wirich von Gemmingen. 1575. Bartol----Mot. 1555. V. Hans Funk der zeit Burgermeister Die erst. 1555. Hans Ulrich Stigelheimer zu Durathenig Fußlicher. kr. Hoffmeister. 1591.

Præsul de Langheim rediens Cisterlia ab urbe
Pyramidem hanc posuit flammis Cælestibus auctam.
Sentiat hæc etiam Numen spirabile toto
Pectore, & illius semper sit munere felix.

Johann.

Johann. Abt zu Langh. 1601. Joh. Abt zu Schoenthal. 1584. Eberhard von Gemmingen. 1555. David von Helmstad Amtman. Graff Fridrich zu Mompelyard. Hans Heinrick von Lammestein. Sigmund Signiger. L. H. Z. W. A. 353. G. L. Mary graff au Brandenb. 1562. Georg. Ernest Graff zu Henneb. Herr zu Aeschaffb. 1575. Michel Helmling Statt-Schreiber. 1555. Hans Ulrick von Steine. 1575. Daniel von Helmstatt. zu Keppenaw. 1556. Stamel von Reischbach. 1575. Wilhelm von Chrombach 1588. Bernolp von Gammingen. 1588. Schweiker Wumbold von Umstatt. 1591. Heinrich Link Pfarrer zu Uden. Andreas von Oberbach Vorsteiff. zu Neu-Statt. Neubrecht Bart Keller zu Neustatt. 1557. Ernberg. Thomas Busch von Schorndorff. Wolfgang von Gemmingen 1588. Feit Kumeter Forstmeister. 1551. and 1530.

Together with several more too tedious to recite; and even these might have spar'd the Reader, but that I found the Instance so particular and solemn: But this (as we shall shew) comes not yet by forty foot near to the dimensions of an Oak standing lately in Worksep-Park, belonging to his Grace the Duke of Norfolk Earl Marshal of England, spreading almost 3000 Yards square, and under the shade whereof, near a Thousand Horse might commodiously stand at once. But, besides this Gigantic Lime-tree, there is likewise a White-thorn, brought (as the Tradition goes) a small twig, out of Palestine Anno 1470. by Eberhard first Duke of Wirtemberg, and planted near Tubing, where he founded St. Peters Monastery, the Branches whereof being sustain'd by forty Columns of Stone, is yet a flourishing Tree: 'Tis probable that of Glastenbury is of this kind, and above a Thousand-years antienter, if the report be true. At Forti grows a Filbert whose Trunk is as big as three Mens middles: Near Esling is a Juniper-tree of almost two foot diameter in the lower trunk, and very tall: These Prodigies, with several more, we have from Dr. Faber, Physician to Fredric Duke of Wirtemberg, and Collected by the late industrious Jesuite Schotti in his Appendix ad lib. 2. De Mirabilibus Miscellaneis: Nor may here that goodly Birch-tree be forgotten, which growing in one of the Courts of the Palace of Augustsburg, is so spreading, as that the Branches will cover 365 Tables, even as many as there are Days in the Year, with its shade, as Tavernier tells us in his Travels. Mr. Cook, in his ingenious, and useful Treatise, mentions a Witch-Elm growing within these three, or four years in Sr. Walter Bagots Park in the County of Stafford, which after too men had been five days felling, lay forty yards in length; Was at the foot seventeen foot diameter: It broke in the fall fourteen load of Wood, forty eight Load in the Top: Yielded eight pair of Naves, 8660. foot of Boards and Planks: It cost ten pounds seventeen Shillings the sawing, the whole esteem'd 97 Tuns: This was certainly a goodly Stick.

11. I am told of a very Withy-tree to be seen somewhere in Barkshire, which is increased to a most stupendious bulk; and of two Witch-hazel-trees of prodigious size growing in Okeley-Park, belonging

belonging to Sir Edw. Poole near Malmesbury in Wiltshire; not inferior to the largest Oaks: But these for arriving hastily to their Acme, and period, and generally not so considerable for their use; I pass to the Ash, Elm, Oak, &c.

There were of the first of these divers which measur'd in length one hundred and thirty two foot, sold lately in Essex: and in the Manor of Horton (to go no farther than the Parish of Ebham in Surrey, belonging to my Brother Richard Evelyn Esq;) there are Elms now standing in good numbers, which will bear almost three foot square for more than forty foot in height, which is (in my judgement) a very extraordinary matter. They grow in a moist Gravel, and in the Hedge-rows.

Not to insist upon Beech, which are frequently very large; there are Oaks of forty foot high, and five foot diameter yet flourishing in divers old Parks of our Nobility and Gentry.

A large and goodly Oak there is at Reedham in Sir Richard Berneys Park of Norfolk, which I am inform'd was valu'd at forty pounds the Timber, and twelve pounds the lopping wood.

12. Nor are we to over-pass those memorable Trees which so lately flourished in Dennington Park near Newbury; amongst which, three were most remarkable from the ingenious Planter, and dedication (if Tradition hold) of the famous English Bard, Geoffrey Chaucer; of which one was call'd the Kings, another the Queens, and a third Chaucers Oak. The first of these was fifty foot in height before any bough or knot appear'd, and cut five foot square at the butt-end, all clear Timber. The Queens was fell'd since the Wars, and held forty foot excellent Timber, straight as an arrow in growth and grain, and cutting four foot at the stub, and near a yard at the top; besides a fork of almost ten foot clear timber above the shaft, which was crown'd with a shady tuft of boughs, amongst which, some were on each side curved like Rams-horns, as if they had been so industriously bent by hand. This Oak was of a kind so excellent, cutting a grain clear as any Clap-board (as appear'd in the Wainscot which was made thereof) that a thousand pities it is some Seminary of the Acorns had not been propagated, to preserve the species. Chaucers Oak, though it were not of these dimensions, yet was it a very goodly Tree: And this account I receiv'd from my most honour'd friend Phil. Packer Esq; whose Father (as now the Gentleman + his Brother) was proprietor of this Park: But that which I would farther remark, upon this occasion, is, the bulk, and stature to which an Oak may possibly arrive within less than three hundred years; since it is not so long that our Poet flourish'd (being in the Reign of King Edward the fourth) if at least he were indeed the Planter of those Trees, as 'tis confidently affirm'd. I will not labour much in this enquiry; because an implicit faith is here of great encouragement; and it is not to be conceiv'd what Trees of a good kind, and in apt soil, will perform in a few years; and this (I am inform'd) is a sort of gravelly clay, moistn'd with small, and frequent springs. In the mean while, I have often wish'd, that Gentlemen were more curious of transmitting to Posterity, such Records, by noting the years when

when they begin any considerable Plantation; that the Ages to come may have both the satisfaction, and encouragement by more accurate and certain Calculations. I find a Jewish tradition, cited by the learned Bochart, That Noah planted the Trees (he supposes Cedars) of which he afterwards built the Ark that preserv'd him: nor was it esteem'd any diminution for Princes themselves to plant Trees with that hand which held the Scepter and Reins of Empire: so as in the Voorhout of the Hague, stands a Tree plac'd there by the hands of the Emperour Charles, which is yet in its prime growth, and no small boast of the good people: But to proceed.

13. There was in Cuns-burrow (sometimes belonging to my Lord of Dover) several Trees bought by a Couper, of which he made ten pound per yard for three or four yards, as I have been credibly assur'd: But where shall we parallel that mighty Tree which furnish'd the Main-mast to the Sovereign of our Seas, which being one hundred foot long save one, bare thirty five inches diameter. Yet was this exceeded in proportion, and use, by that Oak which afforded those prodigious beams that lye thwart her. The diameter of this Tree was four foot nine inches, which yielded four square beams of four and forty foot long each of them. The Oak grew about Framingham in Suffolk; and indeed it would be thought fabulous, but to recount only the extraordinary dimensions of some Timber-trees growing in that County; and of the excessive sizes of these materials, had not mine own hands measur'd a Table (more than once) of above five foot in breadth, nine and a half in length, and six inches thick, all intire and clear: This plank cut out of a Tree fell'd down by my Grandfathers order, was made a Pastry-board, and lies now on a frame of solid Brick-work at Watton in Surrey, where it was so placed before the room was finish'd about it, or wall built, and yet abated by one foot shorter, to confine it to the intended dimensions of the place; for at first, it held this breadth, full ten foot and an half in length. Mercurius tells us that the Great Ship call'd the Crown, which the late French King caus'd to be built, has its keel-timber 120 foot long; and the Main-mast 12 foot diameter at the bottom, and 85 in height.

14. To these I might add a Tew-tree in the Church-yard of Crowhurst in the County of Surrey, which I am told is ten yards in compass; but especially that superannuated Yew-tree growing now in Braburne Church-yard, not far from Scots-hall in Kent; which being 58 foot 11 inches in the circumference, will bear near twenty foot diameter, as it was measur'd first by my self imperfectly, and then more exactly for me, by order of the Right Honourable Sir George Carteret, Vice-Chamberlain to his Majesty, and late Treasurer of the Navy: not to mention the goodly planks, and other considerable pieces of squar'd, and clear Timber, which I observ'd to lie about it, that had been hew'd, and sawn out of some of the Arms only torn from it by impetuous winds. Such another Monster I am inform'd is also to be seen in Sutton Church-yard, near Winchester. To these we add what we find taken notice of by the learned, and industriously curious Dr. Plot in his Natural History

History of Oxfordshire: particularly an *Oak* between *Nuncham Courtney* and *Clifton*, spreading from bough-end, to bough-end, 81 foot, shading in *circumference* 560 square yards of ground, under which 2420 men may commodiously stand in shelter. And a bigger than this near the Gate of the *Water-walk* at *Magdalen-Colledge*, whose branches shoot 16 yards from the stem; likewise of another at *Ricat* in the *Lord Norreys*-park, extending its Arms 54 foot, under which 304 horses or 4374 men may sufficiently stand: This is that *Robur Britannicum* so much celebrated by the late *Author of Dodona's Grove*, and under which he leans contemplating in the *Frontispiece*. But these (with infinite others, which I am ready to produce) might fairly suffice to vindicate, and assert our *Proposition*, as it relates to *modern examples*, and sizes of *Timber trees*, comparable to any of the *Ancients*, remaining upon laudable and unsuspected *Record*; were it not great ingratitude to conceal a most industrious, and no less accurate *Account*, which comes to my hands from Mr. *Halton*, Auditor to the Right Hopourable, the most Illustrious, and Noble *Henry Duke of Norfolk*, *Earl-Marshal of England*.

In Sheffield Lordship.

The names of the Persons who gave intelligence of the particulars.
Edw. Rawlston.

15. In the *Hall Park*, near unto *Rivelin*, stood an *Oak* which had eighteen yards without bough, or knot; and carried a yard and six inches square at the said height, or length, and not much bigger near the root: Sold twelve years ago for 11 li. Consider the distance of the place, and Country, and what so prodigious a Tree would have been worth near London.

Cap. Bullock.

In *Firth's Farm* within *Sheffield Lordship*, about twenty years since, a Tree blown down by the wind, made, or would have made two *Forge-hammer-beams*, and in those, and the other wood of that Tree, there was of worth, or made 50 li. and *Godfrey Frogat* (who is now living) did oft say, he lost 30 li. by the not buying of it.

A *Hammer-beam* is not less than 7½ yards long, and 4 foot square at the barrel.

In *Sheffield Park*, below the *Manor*, a Tree was standing which was sold by one *Giffard* (servant to the then *Countess of Kent*) for 2 li. 10 s. to one *Nich. Hicks*; which yielded of sawn *Wair* fourteen hundred, and by estimation, twenty *Chords* of wood.

Ed. Morphy, Woodward.

A *Wair* is twenty yards long, and one foot broad, six score to the hundred: so that, in the said Tree was 10080 foot of *Boards*; which, if any of the said *Boards* were more than half-inch thick, renders the thing yet more admirable.

In the upper end of *Rivelin* stood a Tree, call'd the *Lords-Oak*, of twelve yards about, and the top yielded twenty one *Chord*, cut down about thirteen years since.

In *Sheffield Park*, An. 1646. stood above 100 Trees worth 1000 li. and there are yet two worth above 20 li. still note the place, and market.

In

In the same *Park*, about eight years ago, *Ralph Archdall* cut a Tree that was thirteen foot diameter at the Kerf, or cutting place near the Root.

In the same *Park* two years since, Mr. *Sittwell*, with Jo. *Magson* did chuse a Tree, which after it was cut, and laid aside flat upon a level ground, Sam. *Staniforth* a Keeper, and Ed. *Morphy*, both on horse-back, could not see over the Tree one another's *Hat-crown*. This Tree was afterwards sold for 20 li.

In the same *Park*, near the old foord, is an *Oak-tree* yet standing, of ten yards circumference.

In the same *Park*, below the *Conduit Plain*, is an *Oak-tree* ^{Jo. Halton} which bears a top, whose boughs shoot from the bole some fifteen, and some sixteen yards.

Then admitting 15½ yards for the common, or mean extent of the boughs from the bole, which being doubled is 31 yards; and if it be imagin'd for a diameter, because the Ratio of the diameter to the circumference is 7:22 it follows 113. 355 :: 31. 97 ½ yards which is the circumference belonging to this diameter.

Then farther it is demonstrable in *Geometry*, that half the diameter multiplied into half the circumference produces the Area or quantity of the Circle, and that will be found to be 754 1/10 which is 755 square yards feré.

Then lastly, if a Horse can be limited to three square yards of ground to stand on (which may seem a competent proportion of three yards long, and one yard broad) then may 251 Horses be well said to stand under the shade of this Tree. But of the more Northern Cattle certainly, above twice that number.

Worklopp-Park.

16. In this *Park*, at the corner of the *Bradshaw-rail*, lieth the bole of an *Oak-tree* which is twenty nine foot about, and would be found thirty, if it could be justly measur'd; because it lieth upon the ground; and the length of this bole is ten foot, and no arm, nor branch upon it. ^{Konhelm Homer}

In the same *Park*, at the white gate, a Tree did stand that was from bough end to bough end (that is, from the extrem ends of two opposite boughs) 180 foot; which is witness'd by Jo. *Magson* and Geo. *Hall*, and measur'd by them both. ^{Jo. Magson Geo. Hall}

Then because 180 foot, or 60 yards is the diameter; 30 yards will be the semediameter: And by the former Analogies

$$113. 355 :: 60. 188 \frac{1}{2}$$

and

$$1. 30 :: 94 \frac{1}{2}. 282 \frac{1}{2}$$

That is, the Content of ground upon which this Tree perpendicularly drops, is above 2827 square yards, which is above half an Acre of ground: And the assigning

Z

three

three square yards (as above) for an Horse, there may 942 be well laid to stand in this compass.

Jo. Maydon.

In the same Park (after many hundreds fold, and carried away) there is a Tree which did yield *quarter-cliff bottoms* that were a yard square: and there is of them to be seen in *Worksopp* at this day, and some *Tables* made of the said *quarter-cliff* likewise.

In the same Park, in the place there call'd the *Hawk's-nest*, are Trees forty foot long of *Timber*, which will bear two foot square at the top-end or height of forty foot.

If then a Square whole side is two foot, be inscribed in a Circle, the proportions at that Circle are

	feet
Diameter	2 : 8284
Circumference	8 : 8858
Area	6 : 2831

And because a Tun of *Timber* is said to contain forty solid feet: one of these Columns of Oak will contain above six Tun of *Timber* and a quarter: in this computation taking them to be *Cylinders*, and not tapering like the segment of a Cone.

Welbeck Lane.

17. The Oak which stands in this Lane call'd *Grindal Oak*, hath at these several distances from the ground these Circumferences,

	foot	foot	inch
at 1	33	:	01
at 2	28	:	05
at 6	25	:	07

The breadth is from bough end to bough end (i.e.) *diametrically* 88 foot; the height from the ground to the top-most bough 81 foot [this dimension taken from the proportion that a *Gnomon* bears to the shadow] there are three Arms broken off and gone, and eight very large ones yet remaining, which are very fresh and good *Timber*.

88 foot is 29½ yards, which being in this case admitted for the diameter of a circle, the square yards in that circumference will be 676 fere; and then allowing three yards (as before) for a beast, leaves 225 beasts, which may possibly stand under this Tree.

But the *Lords Oak*, that stood in *Rivelin*, was in diameter three yards, and twenty eight inches; and exceeded this in circumference three feet, at one foot from the ground.

Shire-Oak.

Hen. Homer.

Shire-Oak is a Tree standing in the ground late Sir Tho. Hewett, about a mile from *Worksopp-Park*, which drops into three Shires, viz. *York*, *Nottingham* and *Derby*, and the distance from bough-end to bough-end, is ninety foot, or thirty yards.

This

This circumference will contain near 707 square yards, sufficient to shade 225 horse.
Thus far the accurate Mr. Haltoh.

18. Being inform'd by a person of credit, that an Oak in *Sheffield-Park*, call'd the *Ladies Oak*, fell'd, contain'd forty-two Tun of *Timber*, which had Arms that held at least four foot square for ten yards in length; the Body six foot of clear *Timber*: That in the same Park, one might have chosen above 1000 Trees worth above 6000 li. another 1000 worth 4000 li. &c. *sic de ceteris*: To this M. Halton replies, That it might possibly be meant of the *Lords Oak* already mention'd to have grown in *Rivelin*: For now *Rivelin* it self is totally destitute of that issue the once might have gloried in of Oaks; there being only the *Hall-Park* adjoining, which keeps up with its number of Oaks. And as to the computation of 1000 Trees formerly in *Sheffield-Park* worth 6000 li. it is believ'd there were a thousand much above that value; since in what is now inclos'd, it is evident touching 100 worth a thousand pounds. I am inform'd that an Oak (I think in *Shropshire*) growing lately in a Coppice of my Lord Craven's, yielded 19 Tun and half of *Timber*, 23 Cord of *Fire-wood*, 2 load of *Brush*, and 2 load of *Bark*. And my worthy friend Leonard Pinckney Esq; lately first Clerk of his Majesties Kitchen, did assure me, that one John Garland built a very handsome Barne, containing five Bates, with Pan, Posts, Beams, Spars, &c. of one sole Tree growing in *Worksopp-Park*. I will close This with an Instance which I greatly value, because it is transmitted to me from that honourable and noble Person Sir Ed. Harley: I am (says he) assur'd by an Inquisition taken about 200 years since, that a Park of mine, and some adjacent Woods, had not then a Tree capable to bear Acorns; Yet, that very Park I have seen full of great Oaks, and most of them in the extremeſt Wane of decay. The Trunk of one of these Oaks afforded so much *Timber*, as upon the place would have yielded 15 li. and did compleatly seat with Wainſcot Pews a whole Church: You may please (says he, writing to Sir Rob. Morray) to remember when you were here, you took notice of a large Tree, newly fain; When it was wrought up, it proved very hollow and unfound: One of its cavities contain'd two Hogs-heads of Water, Another was filled with better stuff, Wax and Honey; Notwithstanding all defects, it yielded, besides three Tun of *Timber*, 23 Cords of Wood: But my own Trees are but Chips in comparison of a Tree in the Neighbourhood, in which every foot forward one with another, was half a Tun of *Timber*, it bore 5 foot square, 40 foot long; It contain'd 20 Tun of *Timber*, most of it sold for 20 s. per Tun; besides that the Boughs afforded 25 Cords of *Fuel-wood*; This was call'd the *Lady-Oak*: Is't not pity such goodly creatures should be devoted to Vulcane? &c. So far this noble Gent. to which I would add Dire, a deep Execration of *Iron-Mills*, and I had almost said *Iron-Masters* too,

Quos ego; sed motos prestat componere —

Z 2

for

for I should never finish to pursue these *Instances* through our once goodly *Magazines* of *Timber* for all uses, growing in this our native *Country*, comparable (as I said) to any we can produce of *elder times*; and that not only (though chiefly) for the encouragement of *Plasterers*, and *Preservers* of one of the most excellent, and necessary *Materials* in the *World* for the benefit of Man; but to evince the continu'd *vigor* of *Nature*, and to reproach the want of *Industry* in this *Age* of ours; and (that we may return to the *Argument* of this large *Chapter*) to assert the *procerity*, and *statue* of *Trees* from their very great *Antiquity*: For certainly, if that be true, which is by divers affirmed concerning the *Quercetum* of *Mambre* (where the *Patriarch* entertain'd his *Angelical* Guests) recorded by *Ensebius* to have continued till the time of *Constantine* the Great, we are not too prejudicately to censure what has been produc'd for the proofs of their *Antiquity*; nor for my part do I much question the *Authorities*: But let this suffice; what has been produc'd being not only an historical *speculation* of *encouragement* and *use*, but such as was pertinent to the *subject* under consideration, as well as what I am about to add concerning the *Texture*, and *similar* parts of the body of *Trees*, which may also hold in *shrubs*, and other *lignous* plants; because it is both a *curious*, and *Rational* account of their *Anatomization*, and worthy of the sagacious *Inquiry* of that learned Person the late Dr. *Goddard*, as I find it entered amongst other of those precious *Collections* of this *Illustrious Society*.

19. The *Trunk* or bough of a *Tree* being cut *transversely* plain and smooth, sheweth several *Circles* or *Rings* more or less *Orbicular*, according to the external figure, in some *parallel* proportion, one without the other, from the *centre* of the *Wood* to the inside of the *Bark*, dividing the whole into so many *circular* spaces. These *Rings* are more large, gross, and distinct in colour and substance in some *kind* of *Trees*, generally in such as grow to a great bulk in a short time, as *Fir*, *Ash*, &c. smaller or less distinct in those that either not at all, or in a longer time grow great; as *Quince*, *Holly*, *Box*, *Lignum-vite*, *Ebony*, and the like sad colour'd and hard *woods*; so that by the largeness, or smallness of the *Rings*, the quickness, or slowness of the growth of any *Tree* may perhaps at certainty be estimated.

These *spaces* are manifestly broader on the one side, than on the other, especially the more outer, to a double proportion, or more; the inner being near an equality.

It is asserted, that the larger parts of these *Rings* are on the *South* and *sunny* side of the *Tree* (which is very rational and probable) inasmuch, that by cutting a *Tree transversely*, and drawing a *diameter* through the broadest and narrowest parts of the *Rings*, a *Meridian* line may be described.

The outer spaces are generally narrower than the inner, not only in their narrower sides, but also on their broader, compared with the same sides of the inner: Notwithstanding which, they are for the most part, if not altogether, bigger upon the whole account.

Of

Of these spaces, the outer extremities in *Fir*, and the like *woods*, that have them larger and grosser, are more dense, hard, and compact; the inner more soft and spongy; by which difference of substance it is, that the *Rings* themselves come to be distinguished.

According as the bodies and boughs of *trees*, or several parts of the same, are bigger, or lesser, so is the *number*, as well as the *breadth* of the *circular* spaces greater or less; and the like, according to the *age*, especially the *number*.

It is commonly, and very probably asserted, that a *Tree* gains a *new* one every year. In the body of a great *Oak* in the *New-Forest*, cut *transversely even* (where many of the *Trees* are accounted to be some hundreds of years old) three, and four hundred have been distinguish'd. In a *Fir-tree*, which is said to have just so many rows of boughs about it, as it is of years growth, there has been observed just *one* less, immediately above one row, than immediately below: Hence some probable account may be given of the difference between the outer, and the inner parts of the *Rings*, that the outermost being newly produced in the *Summer*, the exterior superficies is condens'd in the *Winter*.

20. In the young branches and twigs of *Trees* there is a *pith* in the middle, which in some, as *Ash*, and especially *Elder*, equals, or exceeds in dimensions the rest of the substance, but waxes less as they grow bigger, and in the great boughs and trunk scarce is to be found: This gives way for the growth of the inward *Rings*, which at first were less than the outer (as may be seen in any *shoot* of the first year) and after grow thicker, being it self *absurd*, or perhaps converted into *Wood*; as it is certain *Cartilages* or *Griffles* are in *bones* (in the bodies of *Animals*) from which to sense they differ even as much as *pith* from *Wood*.

These *Rings* or spaces appearing upon *transverse Section* (as they appear *elliptical* upon *oblique*, and straight lines upon direct *Section*) are no other than the extremities of so many *Integuments*, investing the whole *Tree*, and (perhaps) all the boughs that are of the same age with any of them, or older.

The growth of *Trees Augmentation* in all dimensions is acquired, not only by *accesion* of a new *Integument* yearly, but also by the *Reception* of nourishment into the *Pores* and substance of the rest, upon which they also become thicker; not only those towards the middle, but also the rest, in a thriving *Tree*: Yet the principal growth is between the *bark* and *body*, by *accesion* of a new *Integument* yearly, as hath been mentioned: Whence the cutting of the *bark* of any tree or bough round about, will certainly kill it.

The *bark* of a *Tree* is distinguish'd into *Rings*, or *Integuments* no less than the *Wood*, though much smaller or thinner, and therefore not distinguishable, except in the thick *barks* of great old *Trees*, and toward the *inside* next the *wood*; the outer parts drying and breaking with innumerable *fissures*, growing wider and deeper, as the body of the *Tree* grows bigger, and, mouldering away on the out-side.

Though it cannot appear by reason of the continual decay of it

it upon the account aforesaid; yet it is probable, the *bark* of a *Tree* hath had successively as many *Integuments* as the *wood*; and that it doth grow by acquisition of a *new one* yearly on the inside, as the *wood* doth on the out-side; so that the chief way, and conveyance of nourishment to both the *wood* and the *bark*, is between them both.

The least *bud* appearing on the body of a *Tree*, doth as it were make *perforation* through the several *Integuments* to the middle, or very near; which part is as it were, a *Root* of the bough into the body of the *Tree*; and after becomes a *knot*, more hard than the other *wood*: And when it is larger, manifestly shewing it self also to consist of several *Integuments*, by the *circles* appearing in it, as in the body: more hard, probably; because strained in room for growth; as appears by its distending, buckling, as it were, the *Integuments* of the *wood* about it; so implicating them the more; whence a *knotty* piece of *wood* is so much harder to cleave.

It is probable, that a *Cyon* or *Bud* upon *Grafting*, or *Inoculating*, doth, as it were, *Root* it self into the *stock* in the same manner as the *branches*, by producing a kind of *knot*. Thus far the accurate *Doctor*.

21. To which permit me to add only (in reference to the *Circles* we have been speaking of) what another curious *Inquirer* suggests to us; namely, That they are caus'd by the *Pores* of the *wood*, through which the *Sap* ascends in the same manner as between the *Wood* and the *Bark*; and that in some *Trees*, the *bark* adheres to the *wood*, as the *Integuments* of *Wood* cleave to one another, and may be separated from each other as the *bark* from the outward-most; and being thus *parted*, will be found on their out-sides to represent the *Colour* of the outer-most, contiguous to the *bark*; and on the inner sides, to hold the *Colour* of the inner side of the *bark*, and all to have a *deeper*, or *lighter* hue on their inner-side, as the *Bark* is on that part more or less *tinged*; which *tinture* is suppos'd to proceed from the *ascendent Sap*. Moreover, by cutting the *branch*, the *ascending Sap* may be examin'd as well as the *Circles*: It is probable, the more frequent the *Circles*, the larger, and more copiously the *liquor* will ascend into it; the fewer, the sooner descend from it. That a *Branch* of three *Circles* cut off at *Spring*, the *Sap* ascending, will be found at *Michaelmas* ensuing; cut again in the same *branch*, or another of equal bigness, to have one more than it had at *Spring*; and either at *Spring* or *Fall* to carry a *Circle* of *Pricks* next the *bark*, at other seasons a *circle* of *wood* only next it. But here the Comparison must be made with *distinction*; for some *Trees* do probably shoot new *tops* yearly till a certain period, and not after; and some have perhaps their *Circles* in their *branches* decreased from their *Bodies* to the extremity of the *branch*, in such *Economy* and *Order*; that (for instance) an *Apple-tree* shoot of this year has one *Circle* of *Pricks* or *wood* less, than the *Graft* of two years growth; and that of two years growth, may the next year have one *Circle* more than it had the last year; but this only till that *Branch* shoot no more *Graft*,
and

and then 'tis doubtful whether the outmost *twig* obtain any more *Circles*, or remain at a *stay*, only *nourished*, not *augmented* in the *Circles*. It would also be inquir'd, whether the *Circles* of *Pricks* increase not till *Midsummer* and after, and the *Circles* of *Wood* from thence, to the following *Spring*? But this may suffice, unless I should subjoin

22. The *vegetative* motion of *Plants*, with the *diagrams* of the *Jesuite Kercher*, where he discourses of their stupendious *Magnitijms*, &c. could there any thing material be added to what has already been so ingeniously inquir'd into by the learned Dr. *Grew* in his *Anatomy of Vegetables*, and that of *Trunks*; where experimentally, and with extraordinary sagacity, he discusses the present subject (with intire satisfaction of the inquisitive *Reader*) beginning at the *seeds*, to the formation of the *Root*, *Trunk*, *Branches*, *Leaves*, *Flower*, *Fruit*, &c. where you have the most accurate descriptions of the several *Vessels*, for *Sap*, *Air*, *Juices*, with the stupendious *Contexture* of all the *Organical* parts; and than which there can be nothing more fully entertaining: So that what Dr. *Goddard*, and other ingenious men, have but conjecturally hinted, is by this inquisitive person (and since, that of the excellent *Malpighius*,) evinced by *autoptical* experience, and profound research into their *Anatomy*; Let us therefore proceed to the *Felling*.

23. It should be in this *status*, vigour and perfection of *Trees*, that a *Felling* should be celebrated; since whiles our *Woods* are *growing* it is pity, and indeed too soon; and when they are *decaying*, too late: I do not pretend that a man (who has occasion for *Timber*) is obliged to attend so many ages ere he fell his *Trees*; but I do by this infer, how highly necessary it were, that men should perpetually be *planting*; that so *posterity* might have *Trees* fit for their service of *competent*, that is, of a *middle* growth and age, which it is impossible they should have, if we thus continue to destroy our *Woods*, without this providential *Planting* in their stead, and *felling* what we do cut down, with great discretion, and regard of the future.

24. Such therefore as we shall perceive to *decay*, are first to be pick'd out for the *Ax*; and then those which are in their state, or approaching to it; but the very thriving, and manifestly improving, indulg'd as much as possible. But to explore the goodness and sincerity of a *standing Tree*, is not the easiest thing in the world; we shall anon have occasion to mention my L. *Bacon's* Experiment to detect the *hollowness* of *Timber*: But there is doubtless none more infallible, than the *boring* it with a midding *Piercer* made *Auger* fashion, and by frequent pulling out, and examining what substance comes along with it, as those who bore the *Earth* to explore what *Minerals* the place is impregn'd with, and as found *Cheeses* are tasted: Some again there are who by digging a little about the *Roots*, will pronounce shrewdly concerning the *state* of a *Tree*; and if they find him perish'd at the *top* (for *Trees* die upwards as *Men* do from the *feet*) be sure the cause lies deep
for

for 'tis ever a mark of great decay in the *Roots*. There is also a swelling *Vein* which discovers it self eminently above the rest of the *stem*, though like the rest, invested with *bark*, and which frequently circles about and embraces the *tree*, like a branch of *Ivy*, which is an infallible indication of *Hollowness* and hypocrisy within.

25. The time of the *year* for this destructive *work* is not usually till about the end of *April* (at which season the *bark* does commonly rise freely) though the opinions and practice of men have been very different: *Vitruvius* is for an *Autumnal fall*; others advise *December* and *January*: *Cato* was of opinion *trees* should have first born their *fruit*, or, at least, not till full ripe, which agrees with that of the *Architect*; who begins his *Fell* from the commencement of *Autumn* to the *Spring*, when *Favonius* begins to spire, and his reason is; for that from *thence*, during all the *Summer*, *Trees* are as it were *going with Child*, and diverting all their nourishment to the *Embryo*, *Leaves*, and *Fruit*, which renders them weak and infirm: This he illustrates from *Teeming Women*, who during their *pregnancy* are never so healthful, as after they are delivered of their burden, and abroad again; And for this reason (says he) those *Merchants*, who expose *Slaves* to *Sale*, will never *Warrant* one that is with *Child*; The *Buyer* was (it seems) to stand to the hazard; Thus he: But I remember *Monsieur Perrault* in his pompous *Edition* of our *Author*, and learned *notes* upon this *Chapter*, reproves the *Instance*, and corrects the Text *à disparatione procreationis*, &c. to *ad disparationem*, &c. affirming that *Women* are never more sound, and healthy than when they are *pregnant*; the nutrition deriv'd to the *Infant*, being (according to him) no diminution or prejudice to the *Mother*; as being but the consumption of that *humiditie*, which enfeebles the bearing *Woman*, and thence infers, that the *Comparison* cannot hold in *Trees*, which become so much *stronger* by it: But to insist no longer on this; There is no doubt, that whilst *Trees* abound in over-much crude, and superfluous moisture (though it may, and do contribute to their production and fertility) they are not so fit for the *Ax* as when being discharg'd of it, and that it rises not in that quantity as to keep on the *Leaves* and *Fruit*, those *lax*ed parts, and *Vessels* by which the humour did ascend, grow dry, and close, and are not so obnoxious to putrefaction, and the worm: Hence it is, that he cautions us to take notice of the *Moons* decline, because of her dominion over *liquids*, and directs our *Woodman* (some days before he *fell's* downright) to make the *gash* or overture, *Usque ad mediam medullam*, to the end the whole *moisture* may exsile; for that not only by the *Bark* (which those who resemble *Trees* to *Animals* will have to be *analogous* to *Arteries*) does the *Juice* drain out; but by that more *fat*, and whiter substance of the *Wood* it self, immediately under the *Bark* (and which our *Carpenters* call the *Sap*, and therefore hew away, as subject to rot) which they will have to be the *Veins*: It is (say they) the office of these *Arteries* or *Bark*, receiving nourishment

* Post autum
Pridum à die
6 Kal. Jan. affis
ad Archi or-
tum, scil. 8 Kal.
Octob. Veget.
rei milit. l. 5.
c. 9.

nishment from the *Roots*, to derive it to every part of the *Tree*, and to remand what is crude, and superfluous by the *Veins* to the *Roots* again; whence, after it has been better digested, it is made to ascend a second time by the other *Vessels* in perpetual *Circulation*; and therefore necessary so deep an incision should be made as may serve to exhault both the *Venal*, and *Arterial* moisture: But for this nice *speculation* I refer the curious to the already mention'd *Dr. Grew*, and to the learned *Malpighius*, who have made other and far more accurate observations upon this subject: In the mean time, as to that of the *Worm*, though *Timber* unbarb'd be indeed more obnoxious to them, and to contract somewhat a darker hue (which is the reason so many have commended the *season* when it will most freely *strip*) yet were this to be rather consider'd for such *trees* as one would leave *round*, and *unsquar'd*; since we find the wild *Oak*, and many other sorts, *fell'd* over late, and when the *sap* begins to grow proud, to be very subject to the *worm*; whereas, being cut about *mid-Winter*, it neither *casts*, *rips*, nor *twines*; because the cold of the *Winter* does both dry, and consolidate; while in *spring*, and when pregnant, so much of the virtue goes into the *leaves* and *branches*: Happy therefore were it for our *Timber*, some real *Invention* of *Tanning* without so much *Bark* (as the Honourable Mr. Charles Howard has most ingeniously offer'd) were become universal, that *Trees* being more early felled, the *Timber* might be better *season'd* and condition'd for its various *Uses*. But as the custom is, men have now time to *fell* their *Woods*, even from *Mid winter* to the *Spring*; but never any after the *Summer Solstice*: And now we speak of *Tanning*, they have in *Jamaica* the *Mangrove*, *Olive*, and a third whole *Barks* *Tan* much better than do ours in *England*; so as in six weeks, the *Leather* is fit to be employ'd to any use: They have likewise there a *Tree*, whose *Berries* wash better, and whiter than any *Castile-soap*.

26. Then for the *Age* of the *Moon*, it has religiously been observ'd; and that *Diana's* presidency in *Sylvia* was not so much celebrated to credit the *fiction* of the *Poets*, as for the Dominion of that moist *Planet*, and her influence over *Timber*: For my part, I am not so much inclin'd to these *Criticisms*, that I should altogether govern a *Felling* at the pleasure of this mutable *Lady*; however there is doubtless some regard to be had,

Nor is't in vain Signs fall and rise to note.

Nec frustra signorum obitus speculamur, & oros.

The *Old Ruler* are these:

Fell in the *decrease*, or four days after *conjunction* of the two great *Luminaries*; some the last quarter of it; or (as *Pliny*) in the very article of the *change*, if possible; which hapning (saith he) in the last day of the *Winter Solstice*, that *Timber* will prove *immortal*: At least should it be from the *twentieth* to the *thirtieth* day, according to *Columella*: *Cato* four days after the *Full*, as far better for the growth, nay *Oak* in the *Summer*: But all *vineous* *Trees* *silente Luna*; such as *Sallows*, *Birch*, *Poplar*, &c.

A a

Vegetius

Vegetius for ship timber, from the fifteenth to the twenty-fifth, the *Moon* as before; but never during the *Increase*, Trees being then most abounding with moisture, which is the only source of putrefaction: And yet 'tis affirm'd upon unquestionable Experience, that *Timber* cut at any season of the year, in the *Old Moon*, or last *Quarter*, when the *Wind* blows *Westerly*; proves as sound, and good as at any other period whatsoever; nay, all the whole *Summer* long, as in any *Month* of the *Year*; (especially *Trees* that bear no fruit.) *Theophrastus* will have the *Fir*, *Pine* and *Pitch-tree* fell'd, when first they begin to bud: I enumerate them all, because it may be of great use on some publick emergencies.

27. Then for the *temper*, and time of day: The *Wind* low, neither *East* nor *West* (but *West* of the two) the *East* being most pernicious, and exposing it to the *worms*; and for which the best cure is, the plentiful fobbing it in *water*; neither in *frosty*, *wet*, or *dewy* weather; and therefore never in a *Fore-noon*, but when the season has been a good while *drie* and *calm*; for as the *Rain* fobs it too much, so the *Wind* closes, and obstructs the moisture from ouling out. Lastly, touching the *species*; Fell *Fir* when it begins to spring; not only because it will then best quit its coat and strip; but for that they hold it will never decay in *water*; which howsoever *Theophrastus* deduce from the old Bridge made of this material over a certain River in *Arcadia*, cut in this season, is hardly sufficient to satisfy our inquiry.

28. Previous to this work of *Felling* is the advice of our Countryman *Markham*, and it is not to be rejected: Surv-y (saith he) your *Woods* as they stand, immediately after *Christmas*, and then divide the *species* in your mind; (I add rather in some Note-Book, or *Tablets*.) and consider for what purposes every several kind is most useful, which you may find in the several *Chapters* of this Discourse under every *Head*. After this, reckon the *bad* and *good* together, so as one may put off the other, without being forc'd to glean your *Woods* of all your best *Timber*. This done (or before) you shall acquaint your self with the *marketable prices* of the *Country* where your *Fell* is made, and that of the several *sorts*; as what so many *inches* or *foot square*, and *long* is worth for the several employments: What *Planks*, what other scantlings, for so many *speaks*, *Naues*, *Rings*, *Pales*, *Poles*, *Spars*, &c. as suppose it were *Ash*, to set apart the *largest* for the *Wheel-wright*, the *smallest* for the *Cooper*, and that of ordinary scantling for the *Ploughs*, and the *brush* to be *kidded*, and sold by the hundred, or thousand, and so all other sorts of *Timber*, viz. *large*, *middling* *stuff*, and *Poles*, &c. allowing the *waste* for the charges of *Felling*, &c. all which you shall compute with greater certainty, if you have leisure, and will take the pains to examine some of the *trees* either by your own *Fathom*; or (more accurately) by *girting* it about with a *string*, and so reducing it to the *square*, &c. by which means you may give a near guess: or, you may mark such as you intend to *Fell*; and then begin your *sale* about *Candlemas* till the *Spring*; before which you must not (according as our Cu-

stom

stom is) lay the *Ax* to the *Root*; though some for particular imployments, as for *Timber* to make *Ploughs*, *Carts*, *Axle-trees*, *Naues*, *Harrows*, and the like *Husbandry-tools*, do frequently cut in *October*.

Being now entering with your *Workmen*, one of the first, and most principal things, is, the skilful *disbranching* of the *Boal* of all such *Arms*, and *Limbs* as may endanger it in the *Fall*, wherein much forecast and skill is requir'd of the *Wood-man*; so many excellent *trees* being utterly spoiled for want of this consideration: And therefore in arms of *Timber*, which are very great, chop a *nick* under it close to the *Boal*, so meeting it with the downright strokes, it will be sever'd without *splitting*.

29. We have shew'd why some, four or five days before *falling*, bore the *Tree* cros-way; others cut a *kerf* round the body, almost to the very *pith*, or heart, and so let it reman a while; by this means to drain away the moisture, which will distill out of the wounded *Veins*, and is chiefly proper for the *moister* sort of *Trees*: And in this work the very *Ax* will tell you the difference of the *Sex*; the *Male* being so much harder, and browner than the *Female*: But here (and wherever we speak thus of *Plants*) you are to understand the *analogical*, not proper distinction.

30. But that none may wonder why in many *Authors* of good note, we find the *Fruit-bearers* of some *Trees* call'd *Males*, and not rather *Females*, as particularly the *Cypress*, &c. This preposterous denomination had (I read) its source from very ancient *Custom*, and was first begun in *Egypt* (*Diodorus* says in *Greece*) where we are told, that the *Father* only was esteem'd the sole *Author* of *Generation*; the *Mother* contributing only *Receptacle*, and *Nutrition* to the *Off-spring*, which legitimated their mixtures as well with their *Slaves* as *Free-women*: And upon this account it was, that even *Trees* bearing *Fruit*, were amongst them reputed *Males*, and the *sterile* and barren ones, for *Females*; and we are not ignorant, how learnedly this *doctrine* has been lately reviv'd by some of our most celebrated *Physicians*: But since the same *Arguments* do not altogether quadrate in *Trees*, where the *Coition* is not so sensible (whatever they pretend of the *Palms*, &c. and other amorous intertwining of *Roots*) in my opinion we might with more reason call that the *Female* which bears any eminent *Fruit*, *Seed* or *Egg* (from whence *Animals*, as well as *Trees*, not excepting *Man* himself, as the learned *Steno*, *Swamerdam* and others have, I think, undeniably made it out) and them *Males* who produce none: But sometimes too the *rudeness*, or less *perity* of the *leaves*, *bark*, and *grain*, may their *Medical* operations, may deserve the distinction; to which *Aristotle* adds *Branchiness*, less *moisture*, quick *maturity*, &c. l. 1. de Pl. c. 3. All which seems to be most conspicuous in *Plum-trees*, *Hollies*, *Ashes*, *Quinces*, *Pears*, and many other sorts; not to insist on such as may be compell'd even to change, as it were, their *Sex*, by *Grafting* and *artificial* Improvements: But I only hint it, and return to

31. *Felling*, which should be as close to the ground as possible may be, if you design a *renascency* from the *Root*; unless you will

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grub

grub for a total destruction, or the use of that part we have already mention'd, so far superiour in goodness to what is more remote from the *Root*, and besides the longer you cut and convert the *Timber*, the better for many uses. Some are of opinion, that the *seedling Oak* should never be cut to improve his *boal*; because, say they, it produces a reddish wood not acceptable to the *Workman*; and that the *Tree* which grows on the *head* of his *Mother* does seldom prove good *Timber*: It is observ'd, indeed, that one foot of *Timber* near the *Root* (though divers I know who otherwise opine) and (which is the proper *kerse*, or cutting place) is worth *three* farther off: And haply, the *successor* is more apt to be tender, than what was cut off to give it place; but let this be enquir'd into at leisure: If it be a *Winter-fell*, for *fuel*, prostrate no more in a day, than the *Cattel* will eat in two days, I mean of the *bronsf-wood*, and when that's done, *kid*, and set it up an end, to preserve it from rotting.

32. When your *Tree* is thus prostrate, strip off the *bark*; and set it so as it may best dry; then cleanse the *Boal* of the *branches* which were left, and *saw* it into lengths for the *squaring*, to which belong the *Measure*, and *Girth* (as our *Workmen* call it) which I refer to the *Buyer*, and to many subsidiary *Books* lately *Printed*, wherein it is taught by a very familiar *Calculus Mechanical* and *easy Method*.

33. But by none in my apprehension set forth, in a more *facile*, and *accurate* way than what that Industrious *Mathematician* Mr. *Leybourn* has Publish'd, in his late *Line of Proportion made Easy*, and other his *Labours*; where he treats as well of the *Square* as the *Round*, as 'tis applicable to *Boards* and *Superficials*, and to *Timber* which is *hew'd* or less rough, in so *Easy* a *Method*, as nothing can be more desired. I know our ordinary *Carpenters*, &c. have generally upon their *Rulers* a *Line*, which they usually call *Gunters-Line*; but they few of them, understand how to Work from it: And divers *Country Gentlemen*, *Stewards*, and *Woodmen*, when they are to *Measure* *Rough Timber* upon the *Ground*, confide much to the *Girt*, which they do with a *string* at about four, or five foot distance from the *Root* or *Great Extream*: Of the *Strings* length, they take a *quarter* for the true *Square*, which is so manifestly erroneous, that thereby they make every *Tree* so *measur'd*, more than a *fifth* part less than really it is. This *mistake* would therefore be reformed; and it were (I conceive) worth the *seller's* while, to inspect it accordingly: Their *Argument* is, That when the *Bark* of a *Tree* is tripp'd, and the *Body* hew'd to a *Square*, it will then hold out no more measure; that which is cut off being only fit for *Fuel*, and the Expence of *Squaring* costs more than the *Chips* are worth. But let us however *Convince* them of this *Error* by confronting the ensuing *Tables*.

P R O B. I.

A *Tree* being 68 *Inches* about, to find how much thereof in Length will make one *foot square*. S O L.

S O L.

A fourth part of 60 *Inches*, is 15, which they take for the due *Square*; wherefore look for 15 *Inches* (*viz.* one foot three *Inches*) in the first *Column* of the first *Table*, and opposite to it in the second *Column*, you shall find 7 *Inches*, 6 tenth parts of an *Inch* (which is somewhat above half an *Inch*) will make one *foot square*. Again,

P R O B. II.

A *Tree* being 136 *Inches* about, and 9 *Foot* in length, to know how many *solid Feet* the *Tree* contains?

S O L.

The fourth part of 136 is 34 *Inches* in the first *Column* of the second *Table*, and 9 foot in the head of it; and opposite to the 34 *inches*, and under 9 *foot*, you shall find 72.25. (*viz.* 72 foot;) and for so much you may sell it, and no more, which is yet less than the true content by above a fifth part.

But supposing (as they ought to do) there were no such *Waste* as is pretended; you will find by the third *Table*, how much in length of any *Cylindrical Timber*, whose *Girt* is known, will make a *foot solid*, and consequently, detect the *Error* of the former customary practice.

P R O B. III.

A *Tree* being 60 *Inches* circumference, to know how much thereof will make a *cubical foot*.

S O L.

Find 60 *Inches* in the first *Column*; and opposite to it in the second *Column*, you shall find 0.6-0 which is to say, 6 *Inches* only: The *Consequence* is, that 6 *Inches* in length of a *Tree* 60 *Inches* Circumference, will make a *foot solid*: Whereas by the other usual procedure, you found there must be 72 *Inches* and above half an *Inch*, to make so much; which is above an *Inch* and half too much in every *Foot's* length, and what that amounts to in many *Feet* 'tis easy to imagine.

So suppose a *Tree* be but 29 *Inches* in Circumference, the same *Table* will in like manner shew, that it requires but 1 *Foot* 2 *Inches* and 3 tenth parts of an *Inch* in length, to make it a *Foot solid* of *Timber*; and thus of any number as far as you will enlarge your *Table*.

But then imagine that the *sides* of the *square* at the *extremities* of *squar'd Timber* are unequal, as frequently it happens, by sometimes

times 5, 6, 10, or more *Inches* difference: Some *Artificers* think they encounter this well enough by adding the *two sides* together, and taking the *moitie* of the side for the *true square*: But this is as *erronious* as the other; especially, if the *sides* differ considerably. v. g. Let one *side* be 30 *Inches*, and the other 138, these added, make 215; the half whereof is 106½, which they estimate for the *true square*; whereas in truth, the *right square* is 74 *Inches*, and one tenth part; which demonstrates the *error* to be 32 *Inches* and 4 *tenths*.

To reform therefore this egregious *mistake*, the fourth *Table* may be calculated to what number of *Inches* you desire: *Example*.

P R O B. IV.

One side of a square of Timber containing 16 *Inches*, and the other 25: to find the side of a square equal unto it.

S O L.

First, find 16 *Inches* in the fourth *Table*, opposite to it you have this number 120411. Then find out 25 *Inches*, and opposite to that occurs 139794, which added, produces 260205, and the half of it 130102½. Find in the *Table* this Number (or the nearest you can to it) and you will see it to stand against 20 *Inches*; which is the *true square* of such an unequal'd-sided piece of Timber.

16	—	120411
25	—	139794
Sum	—	260205
20	—	130102½

Note, In these *Instances* 'tis suppos'd the *Tree* measur'd to carry the same Proportion of *square* throughout the *Piece*, which in almost all *Trees* that are considerably long, does not hold, by reason of its continual *tapering*, which must need cause a great difference in the *squares* at either extrem. Our common *Workmen* do, to adjust this, for the most part, choose the most likely place about the middle of the *Tree*, and take its *square* there; But this is also an *Error*: Therefore in such *Trees*, measure the *square* at both ends, and add the *sides* of the *two squares* together, and half that length shall be the *true square* which the *Tree* does carry throughout. E. g.

Suppose a *Tree* have that side of the *square* at the *But-end* 32 *Inches*, and at the *smaller end* 22 only; Those added, will make 55 *Inches*, and the *moitie* of that 27½, which is the *true side* of the *square*, with which, and the *length*, you may find by the second *Table* the just content.

And, in case your *Tree* be longer than the *Table* provides for (as for example in this second *Table* it proceeds but to 10 *Foot*) take the half, or so many times 10 *Foot*, as its *length* contains, and the odd *Feet*, if they happen, by themselves. V. g.

Suppose a *Tree* being 31 *Inches* square, is 47 foot long; have recourse to 10 *Foot* in the second *Table*, and opposite to 31 in the *Inch Column*,

Column, you'll find 64 *Foot*, 60 parts under the *Column* 10: put this down as many times as any *tens* occur in your 47 *Foot* (which was the length of that *Tree*) and by the same *Table* the odd 7 will give you 45 *Feet* 22 parts, which sum'd together, amount to 303 *Feet*, 62 parts, viz. half a *Foot* and half a quarter of a *Foot*. By this *Method* proceed for any length whatsoever.

There remains but one operation more, which our *Timber-man* can much stand in need of direction in; and that is, for the Measure of *Planks*; because we have occasion sometimes to saw them in the *Wood*: We will therefore add one *Table* more of that, and so dismiss him.

P R O B. V.

A Plank or Board being 9 *Inches* broad: to find how much in length will make one foot.

S O L.

First find out 9 *Inches* in the first *Column*; opposite to that, in the second *Column*, you shall meet 1. 4. 0. which imports 1 *Foot*, 4 *Inches*: so much then in length of a *Plank* or *Board* 9 *Inches* broad, must go to make a *Foot*: So as every 16 *Inches* in length, is a foot of *Plank*, and consequently every 8 *Inches*, half a *Foot*; every 4 *Inches* a quarter, &c. Thus again, if a *Board* hold 2 *Foot* and 3 *Inches* in breadth; 5 *Inches* and 3 tenth parts of an *Inch* in length, will make a square superficial foot of *Plank*, &c. sic de ceteris.

TABLE.

T A B L E I.

F.	In.	F.	In.	Pts.
0	6	4	0	0
	7	2	11	2
	8	2	3	0
	9	1	9	3
	10	1	3	3
	11	1	2	3
I	0	1	0	0
	1	0	10	2
	2	0	8	8
	3	0	7	6
	4	0	6	7
	5	0	5	9
	6	0	5	3
	7	0	4	8
	8	0	4	3
	9	0	3	9
	10	0	3	5
	11	0	3	3
II	0	0	3	0
	1	0	2	8
	2	0	2	6
	3	0	2	3
	4	0	2	3
	5	0	2	1
	6	0	1	9
	7	0	1	8
	8	0	1	7
	9	0	1	6
	10	0	1	5
	11	0	1	4
III	0	0	1	3

The Square of the End of Timber in Feet and Inches.

The length of a Foot solid in Feet, Inches and parts of Inches.

TABLE II.

The length of the Timber.

In.	1		2		3		4		5	
	F.	Pt.	F.	Pt.	F.	Pt.	F.	Pt.	F.	Pt.
-	0	00	0	00	0	00	0	01	0	01
1	0	01	0	01	0	02	0	03	0	03
-	0	01	0	03	0	05	0	06	0	08
2	0	03	0	05	0	08	0	11	0	14
-	0	04	0	08	0	13	0	17	0	21
3	0	06	0	12	0	18	0	25	0	31
-	0	08	0	17	0	25	0	34	0	42
4	0	11	0	22	0	33	0	44	0	55
-	0	14	0	28	0	42	0	56	0	70
5	0	17	0	25	0	52	0	69	0	81
-	0	21	0	42	0	63	0	84	0	05
6	0	23	0	50	0	75	1	00	1	25
-	0	29	0	58	0	88	1	17	1	46
7	0	34	0	68	1	02	1	36	1	70
-	0	39	0	78	1	17	1	56	1	95
8	0	44	0	89	1	33	1	77	2	22
-	0	50	1	90	1	50	1	01	2	51
9	0	56	1	12	1	68	2	25	2	81
-	1	63	1	25	1	88	2	51	3	13
10	1	69	1	39	2	08	2	47	3	47
-	1	76	1	53	2	29	3	06	3	82
11	1	84	1	68	2	52	3	36	4	20
-	1	92	1	84	2	76	3	67	4	59
12	1	00	2	90	3	00	4	00	5	00
-	1	08	2	17	3	25	4	34	5	42
13	1	17	2	35	3	51	4	69	5	87
-	1	26	2	53	3	80	5	06	6	33
14	1	36	2	72	4	08	5	44	6	80
-	1	46	2	92	4	38	5	80	7	30
15	1	55	3	12	4	68	6	25	7	81
-	1	67	3	33	5	00	6	67	8	34
16	1	78	3	55	5	33	7	11	8	89
-	1	89	3	78	5	67	7	56	9	45
17	2	01	4	01	6	02	8	03	10	03
-	2	13	4	25	6	38	8	51	10	63
18	2	25	4	50	6	25	9	00	11	25

TABLE

TABLE II.

The length of the Timber.

In.	6		7		8		9		10	
	F.	Pt.	F.	Pt.	F.	Pt.	F.	Pt.	F.	Pt.
-	0	01	0	01	0	01	0	02	0	02
1	0	04	0	05	0	05	0	06	0	07
-	0	09	0	11	0	13	0	11	0	16
2	0	17	0	19	0	22	0	25	0	28
-	0	26	0	30	0	34	0	39	0	43
3	0	37	0	43	0	49	0	56	0	62
-	0	51	0	59	0	68	0	76	0	85
4	0	66	0	78	0	89	0	99	1	11
-	0	84	0	98	1	12	1	26	1	40
5	1	04	1	22	1	39	1	56	1	74
-	1	26	1	47	1	68	1	89	2	10
6	1	50	1	55	2	00	2	25	2	50
-	1	76	2	05	2	34	2	64	2	93
7	2	04	2	38	2	72	3	06	3	40
-	2	34	2	73	3	12	3	51	3	90
8	2	66	3	11	3	55	3	99	4	44
-	3	01	3	51	4	01	4	52	5	02
9	3	37	3	93	4	49	5	06	5	62
-	3	76	4	29	5	01	5	64	6	27
10	4	16	4	86	5	55	6	24	6	94
-	4	59	5	35	6	12	6	88	7	65
11	5	04	5	88	6	72	7	56	8	40
-	5	51	6	43	7	35	8	27	9	19
12	6	00	7	00	8	00	9	00	10	00
-	6	51	7	51	8	68	9	76	10	85
13	7	04	8	22	9	39	10	56	11	74
-	7	59	8	86	10	13	11	39	12	66
14	8	16	9	53	10	89	12	25	13	61
-	8	76	10	22	11	68	13	14	14	60
15	9	37	10	93	12	49	14	06	15	62
-	10	01	11	67	13	34	15	01	16	68
16	10	67	12	44	14	22	16	00	17	78
-	11	34	13	24	15	13	17	02	18	91
17	12	04	14	05	16	05	18	06	20	07
-	12	76	14	89	17	01	19	14	21	27
18	13	50	15	75	19	00	20	25	22	50

* Note that the short lines of the Inch-Column, between the Figures 1-2-3 &c. do figure half-Inches.

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TABLE

TABLE II.										
The length of the Timber.										
In.	1	2	3	4	5					
	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.
1	2	38	4	75	7	13	9	51	11	88
19	2	54	5	01	7	52	10	03	12	53
20	2	64	5	28	7	82	10	50	13	20
21	2	78	5	55	8	33	11	11	13	89
22	2	92	5	83	8	75	11	07	14	59
23	3	06	8	12	9	18	12	25	15	31
24	3	11	5	42	9	69	12	84	16	05
25	3	30	6	72	10	08	13	44	16	80
26	3	51	7	03	10	55	14	06	17	58
27	3	67	7	34	11	02	14	69	18	30
28	3	83	7	07	11	50	15	34	19	17
29	4	00	8	00	12	00	16	00	20	00
30	4	16	8	32	12	50	16	66	20	83
31	4	34	8	68	13	02	17	36	21	70
32	4	51	9	02	13	54	18	05	22	56
33	4	69	9	39	14	08	18	77	23	47
34	4	88	9	75	14	68	19	51	24	38
35	5	06	10	12	15	19	20	25	25	31
36	5	25	10	50	15	75	21	00	26	25
37	5	44	10	89	16	33	21	78	27	22
38	5	67	11	34	17	01	22	68	28	35
39	5	84	11	68	17	52	23	36	29	25
40	5	04	12	08	18	13	24	17	30	21
41	5	25	12	50	18	75	25	00	31	25
42	6	46	12	92	19	38	25	84	32	30
43	6	67	13	34	20	02	26	69	33	36
44	6	89	13	78	20	67	27	50	34	45
45	7	11	14	22	21	33	28	44	35	55
46	7	33	14	66	21	39	29	33	36	66
47	7	56	15	12	32	68	30	24	37	81
48	7	78	15	56	23	34	31	12	38	90
49	8	03	16	05	24	08	32	11	40	14
50	8	26	16	52	24	79	33	05	41	31
51	8	54	17	01	25	52	34	04	42	39
52	8	70	17	40	26	34	35	00	43	75
53	9	00	18	00	27	00	36	00	44	00

TABLE

TABLE III.										
The Circumference of the Tree in Inches.										
Cir.	Feet	Inch.	Pt.							
10	18	11	2	51	0	8	3	92	0	2
11	14	11	5	52	0	8	0	93	0	2
12	12	6	8	53	0	7	8	94	0	2
13	10	8	5	54	0	7	4	95	0	2
14	9	2	7	55	0	7	2	96	0	2
15	7	10	3	56	0	6	9	97	0	2
16	7	0	8	57	0	6	7	98	0	2
17	6	3	0	58	0	6	4	99	0	2
18	5	7	0	59	0	6	2	100	0	2
19	5	0	2	60	0	6	0			
20	4	6	3	61	0	5	8			
21	4	1	2	62	0	5	6			
22	3	8	9	63	0	5	5			
23	3	4	9	64	0	5	2			
24	3	1	7	65	0	5	1			
25	2	10	7	66	0	4	9			
26	2	8	1	67	0	4	8			
27	2	5	8	68	0	4	7			
28	2	3	7	69	0	4	6			
29	2	1	8	70	0	4	4			
30	2	0	1	71	0	4	3			
31	1	10	6	72	0	4	2			
32	1	9	2	73	0	4	1			
33	1	7	9	74	0	3	9			
34	1	6	8	75	0	3	8			
35	1	5	7	76	0	3	7			
36	1	4	7	77	0	3	7			
37	1	3	8	78	0	3	6			
38	1	3	0	79	0	3	5			
39	1	2	3	80	0	3	4			
40	1	1	6	81	0	3	3			
41	1	0	9	82	0	3	2			
42	1	0	3	83	0	3	2			
43	0	11	7	84	0	3	1			
44	0	11	1	85	0	3	0			
45	0	10	7	86	0	2	9			
46	0	10	2	87	0	2	9			
47	0	9	9	88	0	2	8			
48	0	9	4	89	0	2	7			
49	0	0	0	90	0	2	7			
50	0	8	7	91	0	2	6			

TABLE IV.

TABLE IV.

In.		In.		In.		In.	
1	000000	26	141497	51	170757	76	188081
2	030103	27	143136	52	171600	77	188649
3	047712	28	144715	53	172427	78	189209
4	062206	29	146239	54	173239	79	189762
5	069897	30	147712	55	174036	80	190309
6	077815	31	149136	56	174818	81	190848
7	084509	32	150525	57	175587	82	191381
8	090308	33	151851	58	176342	83	191907
9	095424	34	153147	59	177085	84	192428
10	100000	35	154406	60	177815	85	192941
12	104139	36	155630	61	178532	86	193449
13	107918	37	156820	62	179239	87	193952
13	111394	38	157978	63	179934	88	194448
14	114612	39	159106	64	180618	89	194939
15	117609	40	160205	65	181291	90	195424
16	120411	41	161278	66	181954	91	195904
17	123044	42	162325	67	182607	92	196378
18	125527	43	163346	68	183250	93	196848
19	127875	44	164345	69	183885	94	197312
20	130102	45	165321	70	184509	95	197772
21	132221	46	166275	71	185125	96	198217
22	134242	47	167209	72	185735	97	198677
23	136172	48	168124	73	186332	98	199122
24	138021	49	169019	74	186923	99	199563
25	139794	50	169807	75	187506	100	200000

TABLE

TABLE V.

F.	In.	F.	In.	Pts.
O	1	12	0	0
	2	6	0	0
	3	4	0	0
	4	3	0	0
	5	2	4	0
	6	2	0	0
	7	1	0	0
	8	1	6	0
	9	1	4	0
	10	1	2	4
	11	1	1	1
I	0	1	0	0
	1	0	11	0
	2	0	10	3
	3	0	9	6
	4	0	9	0
	5	0	8	5
	6	0	8	0
	7	0	7	6
	8	0	7	2
	9	0	6	8
	10	0	6	5
II	11	0	6	2
	0	0	6	0
	1	0	5	8
	2	0	5	0
	3	0	5	3
	4	0	5	1
	5	0	5	0
	6	0	4	8
	7	0	4	7
	8	0	4	5
	9	0	4	4
III	10	0	4	2
	11	0	4	1
	0	0	4	0

The Breadth of Plank in Feet and Inches.

The length of a Foot square, in Feet and 10th. part of Inches.

TABLE

Or by a smaller *Compendium* in the following *Tables*.

TABLE VI.				TABLE VII.				TABLE VIII.			
Inches	Feet	Inches	to Parts of a 10 th P.	Inches	Feet	Inches	to Parts of a 10 th P.	Inches	Feet	Inches	to Parts of a 10 th P.
1	44	00	00	16	7	5	1	113	01	7	1
2	30	00	00	17	5	7	2	28	03	4	2
3	15	00	00	18	3	3	3	12	08	8	3
4	50	00	00	19	4	7	4	7	00	8	4
5	59	1	1	20	4	3	5	4	06	5	5
6	40	00	00	21	3	9	6	5	40	3	6
7	21	1	1	22	3	5	7	6	20	7	7
8	23	2	2	23	2	6	8	7	09	5	8
9	10	3	3	24	2	0	9	8	02	5	9
10	15	2	2	25	7	6	10	9	04	7	10
11	10	2	2	26	5	3	11	11	2	2	11
12	100	0	0	27	3	7	12	12	2	2	12
13	01	2	2	28	2	0	13	13	0	3	13
14	06	8	8	29	1	4	14	14	0	3	14
15	07	6	6	30	1	2	15	15	0	3	15

Explanation.

An *Inch* being divided into 10 equal parts, and every of these parts into as many, makes the *Inch* to contain 100 equal parts.

TABLE VI.

The first *Column* containing any number of *Inches* from 1 to 30, you have in each *Table* the length of a foot in feet and *Inches*, and the tenth part of an *Inch* to a tenth of a tenth, viz. to the hundredth part.

Example, for Timber Measure.

I would know how long a piece of *Timber* of 10 *Inches* square ought to be to contain a foot of *Timber*? Look 10 in the left-hand *Column*, opposite to which you will find 1 foot 5 *Inches* 2 tenths of an *Inch*, and 8 tenths of a tenth part of an *Inch*.

TABLE

TABLE VII.

Example, for Board-measure.

I would know how long a *Board* must be of 5 *Inches* broad, to make a *Foot* of *Board*? Find out 5 in the left-hand *Column*, opposite to which you have 2 *Foot*, 4 *Inches*, eight tenths parts.

TABLE VIII.

Example of Round Timber Measure.

I would know how much an exact round piece of *Timber* containing but one *Inch* in diameter must be in length, to make a *Cube* or *Foot* of solid *Timber*? Look fig. 1. in the left hand *Column*, and opposite to it, you will find 113 *Foot*, 1 tenth, 7 tenth parts of an *Inch*, and one tenth part of a tenth part; which in all contains 1728 *Inches*, the thing you sought: and so of the rest.

But all these questions are most exactly, and *Mathematically* demonstrated by Mr. *Cooke*, where also of taking the *Altitude* of *Trees* the better to judge of the worth of them, with the *Measuring* of *Wood-Lands*. &c. together with necessary *Calculations* for the levelling of Ground, and removing of *Earth*, drawing of *Plots*, and *Figures*. all which are very conducive to the several *Arguments* of this *Sylvan Work*. But to proceed.

34. If you are to remove your *Timber*, let the *Dew* be first off, and the *South-wind* blow before you draw it: neither should you by any means put it to use for three, or four months after, unless great necessity urge you, as it did *Dulius*, who in the *Punic War*, built his *Fleet* of *Timber* before it was season'd, being not above two months from the very *Felling* to the *Launching*: and as were also those *Navies* of *Hiero* after forty days; and that of *Scipio*, in the third *Carthaginian War*, from the very *Forest* to the *Sea*. *July* is a good time for bringing home your *fell'd Timber*: But concerning the *Time*, and *Season* of *Felling*, a just *Treatise* might be written: Let the *Learner* therefore consult *Vitruvius* particularly on this subject, l. 2. c. 19. Also *M. Cato* c. 17. *Plin.* l. 16. c. 31. *Constantinus* and *Heron.* l. 3. de *RR. Veget.* l. 4. c. 35. *Columella* l. 3. c. 2. but especially the most ample *Theophrastus* *quarar isovias*, l. 5. Note, that a *Tun* of *Timber* is forty solid *Feet*, a *Load*, fifty.

35. To make excellent *Boards* and *Planks*, 'tis the advice of some, you should *Bark* your *Trees* in a fit season, and so let them stand naked a full year before the *felling*; and in some cases, and grounds, it may be profitable: But let these, with what has been already said in the foregoing *Chapters* of the several *kinds*, suffice for this *Article*: I shall add one *Advertisement* of *Caution* to those *Noble Persons*, and others who have *Groves*, and *Trees* of ornament near their houses, and in their *Gardens* in *London*, and

C c

the

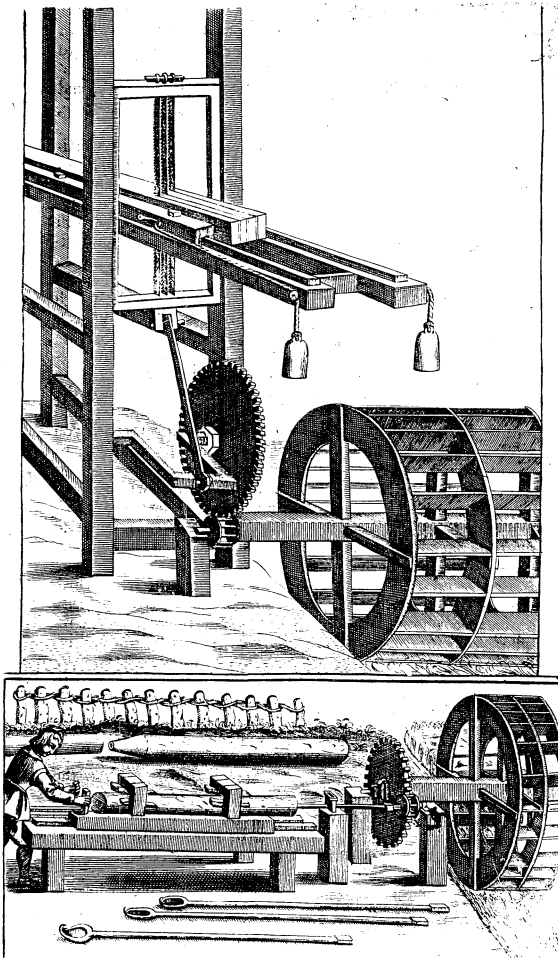
the *Circle* of it; especially, if they be of great *stature*, and well grown; such as are the *Groves* in the several *Inns of Court*; nay, even that (comparatively, new *Plantation*) in my Lord of *Bedfords* Garden, &c. and wherever they stand in the more interior parts of the *City*; that they be not over hasty, or by any means persuaded to cut down any of their *old Trees*, upon hope of new more flourishing *Plantations*; thickning, or repairing deformities; because they grew so well when first they were set: It is to be consider'd how exceedingly that pernicious *Smock* of the *Sea-coal* is increas'd in, and about *London* since they were first planted, and the buildings environing them, and inclosing it in amongst them, which does so universally contaminate the *Air*, that what *Plantations of Trees* shall be now begun in any of those places, will have much ado, great difficulty, and require a long time, to be brought to any tolerable perfection: Therefore let them make much of what they have; and though I discourage none, yet I can animate none to cut down the *old*.

36. And here might now come in a pretty *speculation*, what should be the *Reason* after general *Fellings*, and *Extirpations* of vast *Woods* of one *Species*, the next *spontaneous* succession should be of quite a different *sort*? We see indeed something of this in our *Gardens* and *Corn fields* (as the best of *Poets* witnesses) but that may be much imputed to the alteration, by improvement, or detriment of the *Soil* and other *Accidents*: whatever the *Cause* may be, since it appears not in any universal decay of *Nature* (sufficiently exploded) I shall only here produce matter of *Fa \ddot{a}* , and that it ordinarily happens. As in some goodly *Woods* formerly belonging to my *Grandfather* that were all of *Oak*; after felling, they universally sprung up *Beech*; and 'tis affirm'd by general Experience, that after *Beech*, *Birch* succeeds; as in that famous *Wood* at *Darnway* on the *River Tindarne* in the *Province of Moray* in *Scotland*, where nothing had grown but *Oak* in a *Wood* three *miles* in length, and happily more *Southerly*, it might have been *Beech*, and not *Birch* till the third degradation. *Birches* familiarly grow out of *old*, and decay'd *Oaks*; but whence this *Sympathy*, and affection should proceed, is more difficult to resolve, in as much as we do not detect any so prolific, and eminent seed in that *Tree*. Some *Accidents* of this nature may be imputed to the *Winds*, and the *Birds* who frequently have been known to waft, and convey *Seeds* to places widely distant, as we have touch'd in the *Chapter of Fir*, &c. *Sc \ddot{e} l. 4.* *Holly* has been seen to grow out of *Ash*, as *Ash* out of several *Trees*, especially *Hai-Thorn*; nay, in an old rotten *Ash-stump*, in a place where no *Ashes* at all grew by many *miles* in the whole *County*: And I have had it confidently asserted by *Persons* of undoubted truth, that they have seen a *Tree* cut in the middle, whose heart was *Ash-wood*, and the exterior part *Oak*, and this in *Northamptonshire*: And why not as well (though with something more difficulty?) as through a *Willow*, whose *Body* (as is noted) it has been observed to penetrate even to the *Earth*? obtruding the *Willow* quite out of its place, of which

a pretty *Emblem* might be conceiv'd: But I pursue these *Instances* no farther, concluding this *Chapter* with the *Norway Engine*, or *Saw-Mill*, to be either moved with the force of *Water*, or *Wind*, &c. for the more expedite cutting, and converting of *Timber*, to which we will add another, for the more facile perforation and boring of *Elms*, or other *Timber* to make *Pipes* and *Aqueducts*, and the excavating of *Columns*, to preserve their *Shafts* from splitting, to which otherwise they are obnoxious.

The *Frames* of both these *Instruments* discover themselves sufficiently to the eye, and therefore will need the less description; There is yet this reformation from those which they use both in *Norway*, and *Switzerland*; That whereas they make the *Timber* approach the *Saws*, by certain indented *Wheels* with a *Rocket* (which is frequently out of order) there is in the first *Figure*, a substitution of two *Counterpoises* of about three hundred pound weight, each, as you may see at A. A. fastning the *Cords* to which they append, at the extremities of two moveable pieces of *Timber*, which slide on two other pieces of fixed *Wood*, by the aid of certain small *Pulleys*, which you may imagine to be within an *Hinge* in the *Houfe* or *Mill*, by which means the *Weights* continually draw, and advance the moving pieces of *Wood*, and consequently the *Timber* to be slit, fastned 'twixt the said Pieces, towards the *Teeth* of the *Saws*, rising, and falling as the motion of the *Wheel* directs; And on this *Frame* you may put four or five *Saws*, or more if you please, and place them at what intervals you think fit, according to the dimensions which you design in cutting the *Timber* for your use; and when the piece is sawn, then one or two men with a *Lever* must turn a *Roller*, to which there is annexed a strong *Cord*, which will draw back the *Piece*, and lift up the *Counterpoise*; and so the *piece* put a little towards one side, direct the *Saws* against another.

The second *Figure* for *Boring*, consists of an *Ax-tree*, to which is fastned a *Wheel* of six and thirty *Teeth*, or more, as the velocity of the *Water-motion* requires; for if it be slow, more *Teeth* are requisite; There must also be a *Pinion* of six, turn'd by the said indented *Wheel*. Then to the *Ax-tree* of the *Pinion* is to be fixt a long *Auger*, as in letter A, which must pass through the hole B, to be opened, and clos'd as occasion requires, somewhat like a *Turners Lathe*: the *Tree* or piece of *Timber* to be Bored, is to be plac'd on the *Frame* C D, so as the *Frame* may easily slide by the help of certain small *Wheels*, which are in the hollow of it, and turn upon strong *Pins*, so as the *Work man* may move forwards, or draw the *Tree* back, after 'tis fastned to the *Frame*; that so the *Auger* turning, the end of the *Tree* may be applied to it; still remembering to draw it back at every progress of three, or four inches, which the *Auger* makes for the cleaning it from the *Chips*, lest the *Auger* break: Continue this work till the *Tree*, or piece of *Timber* be bored as far as you think convenient, and when you desire to enlarge the hole, change your *Auger Bits* as the *Figure* represents them.



To these we might add several more, as they are described by *Besson, Ramelli, Cause*, and others; as likewise *Cranes*, and *Machines* for the easier *Elevation, Moving*, and *Transporting* of *Timber*, but they are now become familiar, and therefore I omit them.

C H A P. XXXI.

Of Timber, the Seasoning and Uses, and of Fuel.

Since it is certain and *Demonstrable*, that all *Arts* and *Artisans* *Seasoning*:

Whatever, must *fail* and *cease*, if there were no *Timber* and *Wood* in a *Nation* (for he that shall take his *Pen*, and begin to set down what *Art, Myserie*, or *Trade* belonging any way to *human life*, could be maintain'd and exercis'd without *Wood*, will quickly find that I speak no *Paradox*) I say, when this shall be well consider'd, it will appear, that we had better be without *Gold*, than without *Timber*: This contemplation, and the universal use of that precious *Material* (which yet is not of universal use till it be duly prepar'd) has mov'd me to design a solemn *Chapter* for the *seasoning*, as well as to mention some farther particular *Applications* of it. The first, and chiefest use of *Timber* was doublets for the building of *Houses*, and habitations to shelter *Men* in: It is in his 1. *chap.* 2. *lib.* where *Vitruvius* shews, in what simple, and plain manner, our first progenitors erected their humble *Cottages*; when like those of *Chalcos* and *Phrygia*, they began to creep out of the *subterranean*, and Cavernous *Rocks*, and laid the first *Grounds* upon which they plac'd the upright posts, and rudely fram'd a pointed roof, *Arboribus perpetuis planis* (on which the *Critics* have vent their researches) and from which mean beginning, all the superb, and pompous effects of *Architecture* have proceeded: But to pursue our *Title*, we have before spoken concerning some preparations of *standing Trees* design'd for *Timber*, by a half-cutting, disbarking, and the seasons of *drawing*, and *using* it.

2. Lay up your *Timber* very dry, in an airy place (yet out of the *Wind* or *Sun*) and not standing upright, but lying along one piece upon another, interposing some short *blocks* between them, to preserve them from a certain *mouldiness* which they usually contract while they sweat, and which frequently produces a kind of *fungus*, especially if there be any *sappy* parts remaining.

3. Some there are yet, who keep their *Timber* as moist as they can, by *submerging* it in *Water*, where they let it imbibe to hinder the *cleaving*; and this is good in *Fir*, both for the better *stripping* and *seasoning*; yea, and not only in *Fir*, but other *Timber*: lay therefore your *Boards* a *Fortnight* in the *Water*, and then setting them upright in the *Sun* and *Wind*, so as it may freely pals through them,

them, (especially during the heats of *Summer*, which is the time of finishing *Buildings*) turn them daily; and thus treated, even newly sawn *Boards*, will *Floor* far better than a many years dry *Seasoning*, as they call it. But to prevent all possible *accidents*, when you lay your *Floors*, let the *joyns* be *shot*, fitted, and tack'd down only for the *first year*, nailing them for good and all the *next*; and by this means they will lye *stanch*, close, and without *shrinking* in the least, as if it were all of one piece; and upon this occasion I am to add an *observation* which may prove of no small use to *Builders*; that if one take up *Deal-boards* that may have lain in the floor an *hundred years*, and shoot them again, they will certainly shrink (*totties quoties*) without the former method. Against *Wheel-Wrights* the *Water-seasoning* (which hinders the exhaling of the *Alcaly salt* in it, causing the hardness) is of especial regard, and in such esteem amongst some, that I am assur'd the *Venetians* for their Provision in the *Arsenal*, lay their *Oak* some years in it, before they employ it. Indeed the *Turks*, not only *Fell* at all times of the year, without any regard to the *season*; but employ their *Timber* green and unseason'd; so that though they have excellent *Oak*, it decays in a short time by this only neglect.

Elm fell'd never so green for suddain use, if plung'd four, or five days in *water* (especially *salt*, which is best) obtains an admirable *seasoning*, and may immediately be us'd. Some again commend *buryings* in the *Earth*; others in *wheat*; and there be *seasonings* of the *fire*, as for the scorching and hardning of *Piles*, which are to stand either in the *water*, or the *earth*.

— The Oke

Et suspensa facis explorat robora fumus.

Explore, suspended in the Chimney smoke.

Georg. 1.

For that to most *Timber* it contributes much to its duration. Thus do all the *Elements* contribute to the Art of *Seasoning*. The Learned Interpreter of *Antonio Neris* Art of *Glass* c. 5. speaking of the Difference of *Vegetables*, as they are made use of at various *seasons*, observes from the *Button-mould-makers* in those *woods* they use, that *Pear-trees* cut in *Summer* work toughest, but *Holly* in the *Winter*, *Box* hardest about *Easter*, but mellow in *summer*, *Hawthorn* kindly about *October*, and *Service tree* in the *Summer*.

4. And yet even the greenest *Timber* is sometimes desirable for such as *Carve* and *Turn*; but it chokes the teeth of our *Saws*; and for *Doors*, *Windows*, *Floors*, and other close Works, it is altogether to be rejected; especially, where *Walnut-tree* is the material, which will be sure to shrink: Therefore it is best to choose such as is of *two*, or *three years seasoning*, and that is neither moist nor over-dry; the mean is best. Sir *Hugh Plat* informs us, that the *Venetians* use to burn, and scorch their *timber* in a flaming fire, continually turning it round with an *Engine*, till they have gotten upon it an hard, black, *Coaly* crust; and the Secret carries with it great probability; for that the Wood is brought by it to such a hardness and dryness, ut cum omnis putrefactio incipiat ab humido, nor

nor *Earth*, nor *Water* can penetrate it; I my self remembering to have seen *Charcoals* dug out of the ground amongst the ruins of ancient *Buildings*, which have in all probability, lain cover'd with earth above 1500 years.

5. *Timber* which is cleft, is nothing so obnoxious to rift and cleave as what is hewn; nor that which is squar'd, as what is round; and therefore where use is to be made of huge and massive *Columns*, let them be boar'd through from end to end; it is an excellent preservative from splitting, and not un-philosophical; though to cure this accident, the rubbing them over with a wax-cloth is good, *Painters Putty*, &c. or before it be converted, the smeared the *timber* over with *Cow-dung*, which prevents the effects both of *Sun* and *Air* upon it; if of necessity it must lie expos'd: But besides the former remedies, I find this, for the closing of the chops and clefts of *Green Timber*, to anoint and supple it with the fat of powder'd beef-broth, with which it must be well soak'd, the *chafin's* fill'd with *sponges* dipt into it; this, to be twice done over: Some *Carpenters* make use of *grease* and *sawdust* mingled; but the first is so good a way (says my *Author*) that I have seen *Wind-stock-timber* so exquisitely closed, as not to be discerned where the defects were: This must be us'd when the *Timber* is green.

6. We spake before of *Squaring*, and I would now recommend the *Quartering* of such trees as will allow useful and competent *scantlings*, to be of much more durability, and effect for strength, than where (as custom is, and for want of observation) whole *Beams* and *Timbers* are apply'd in *ships* or *Houses*, with lab and all about them, upon false suppositions of strength beyond these *Quarters*: For there is in all trees an evident *Interstice* or separation between the heart and the rest of the body, which renders it much more obnoxious to decay and miscarry, than when they are treated, and converted as I have describ'd it; and it would likewise save a world of *Materials* in the *Building* of great *Ships*, where so much excellent *timber* is hew'd away to spoil, were it more in practice. Finally,

7. I must not omit to take notice of the coating of *timber* in *Work*, us'd by the *Hollanders* for the preservation of their *Gates*, *Port-cullis's*, *Draw-bridges*, *Sluces*, and other huge *beams* and *Contignations* of *timber* expos'd to the *Sun*, and perpetual injuries of the *Weather*, by a certain mixture of *Pitch* and *Tar*, upon which they strew small pieces of *Cockle*, and other *shells*, beaten almost to powder, and mingled with *Sea-sand*, or the *Scales of Iron*, beaten small and sifted, which incrusts, and arms it after an incredible manner against all these assaults and foreign invaders: But if this should be deem'd more obnoxious to *Firing*, I have heard that a *Wash* made of *Alum*, has wonderfully protected it against the assaults even of that devouring *Element*, and that so a wooden *Tower* or *Fort* at the *Piræum* an *Athenian Port*, was defended by *Archelaus* a Commander of *Mithridates*, from the great *Sylla*; But you have several *Compositions* for this purpose in that incomparable

parable Treatise of Naval Architecture, written in the Low-Dutch by N. Witsen chap. 6. part 1. the Book is a *Folio*, and he that should well translate it into our Language (which I much wonder has not yet been done) would deserve well of the publick.

8. Timber that you have occasion to lay in Mortar, or which is in any part contiguous to Lime-as Doors, Window Cases, Groundsills, and the extremities of Beams, &c. should be cap'd with molten Pitch, which will be a marvellous preserver of it from the burning, and destructive effects of the Lime; and in defect of Pitch, Loam, or Clay will prove a tolerable defence: But though Lime be so destructive whilst Timber lies thus dry, it seems they mingle it with Hair, to keep the Worm out of Ships which they sheath for Southern voyages; though it is held much to retard their course: wherefore the Portugals scorch them with fire, which often proves very dangerous, and indeed their Timber being harder, is not so easily penetrable; and therefore have some been thinking of sending out some tougher sorts of Material, especially of a bitter sap; such as is reported to be the wood of a certain Indian-pear: and some talk of a *Licium* to do the feat; others of a pitchy substance to be extracted out of Sea-coal; but nothing has yet been found more expedient, than the late application of thin lamins of sheet Lead, if that also be no impediment to their failing: However, there are many kind of woods in the Western-Indies (besides the *Acajou*) that breeds no Worms, and such is the white wood of *Jamaica* proper enough to build Ships.

9. For all uses, that Timber is esteem'd the best, which is the most ponderous, and which lying long, makes deepest impression in the Earth, or in the Water being floated; also what is without knots, yet firm, and free from sap; which is that fatty, whiter, and softer part, call'd by the Antients *Album*, which you are diligently to hew away; here we have much ado about the *Tornus* of the Fir, and the *Φλοιὸν τῆς ξύλης* by both *Vitruvius* and *Theophrastus*, which I pass over. You shall perceive some which has a spiral convolution of the veins; but it is a vice proceeding from the severity of unseasonable Winters, and defect of good nutriment.

10. My Lord Bacon Exp. 658. recommends for tryal of a sound or knotty piece of Timber, to cause one to speak at one of the Extremities to his Companion listening at the other; for if it be knotty, the sound (says he) will come abrupt.

11. Moreover, it is expedient that you know which is the Grain, and which are the Veins in Timber (whence the term *suviari arborem*) because of the difficulty of working against it: Those therefore are counted the veins which grow largest, and are softer for the benefit of Cleaving, and Hewing; that the Grain or *Pellines*, which runs in waves, and makes the divers and beautiful chambers which some woods abound in to admiration. The Fir-tree Horizontally cut, has two Circles of different Fibers, which (when the Timber comes to be cleft in the middle) separates into four different Waves, whence *Pliny* calls them *quadrisuivius*, and it is to be

be noted, that the nodous, and knotty part of these sort of Trees, is that only which grows from the first Boughs to the summit or Top, by *Vitruvius* term'd the *Fusterna*, which both *Baldus*, and *Salmastus* derive à *Fuste*. The other clean part, free of these boils, (being that which when the sappy *Slabis* cut away, is the best) he calls *Scipena*. Finally, The Grain of Beech runs two contrary ways, and is therefore to be wrought accordingly; and indeed the grain of all Timber ought well to be observ'd; since the more you work according to it, especially in cleaving, and the less you saw, the stronger will be your work.

12. Here it may be fitly enquir'd, whether of all the sorts we have enumerated, the old, or the younger Trees do yield the fairest Colour, pleasant Grain and Gloss for Wainscot, Cabinets, Boxes, Gun-stocks, &c. and what kind of Pear, and Plumtree give the deepest Red, and approaches nearest in beauty to *Brazil*: 'Tis affirm'd the old Oak, old Walnut, and young Ash, are best for most uses; and yet for Ship-Carpentry this does not always hold; nor does the bigness of it so much recommend it; because 'tis commonly a sign of age, which (like to very old men) is often brittle and effete. Black and thorny Plum-tree is of the deepest Oriency; but whether these belong to the Forest, I am not yet satisfied, and therefore have assigned them no Chapter apart. But now I speak of the Plum-tree, I am assur'd by a worthy Friend, that the Gum thereof dissolv'd in Vinegar, does cure the most contumacious Tettors, when all other remedies outward or inwardly applied, nothing avail'd.

13. Lastly, I would also add something concerning what Woods are observed to be most sonorous for Musical Instruments: We as yet detect few but the German Aer which is a species of Maple, for the Rimmers of Viols, and the choicest, and finest grain'd Fir for the Bellies: The finger-boards, Back, and Ribs, I have seen of *Tew*, Pear-tree, &c. But Pipes, Recorders, and wind-Instruments, are made both of hard, and soft woods; I had lately an Organ with a set of Oaken-pipes, which were the most sweet and mellow that were ever heard; It was a very old Instrument, and formerly, I think, belonging to the Duke of Norfolk.

14. For the place of growth, that Timber is esteem'd best which grows moist in the Sun, and on a dry and hale ground; for those trees which suck, and drink little, are most hard, robust, and longest liv'd, instances of Sobriety. The Climate contributes much to its quality, and the Northern situation is preferred to the rest of the quarters; so as that which grew in Tuscany was of old thought better, than that of the Venetian side; and yet the Biscay Timber, is esteem'd better than what they have from colder Countries: and trees of the wilder kind, and barren, than the over much cultivated, and great bearers: but of this already.

15. To omit nothing, *Authors* have sum'd up the natures of timber; as the hardest Ebony, Box, Larch, Lotus, Terebinth, Cornus, Tew, &c. and though these indurated woods be too ponderous for Ship-carpentry; yet there have been Vessells built of it,

by the *Portugals* in *America*; in which the *Planks*, and innermost *Timbers* had been saw'd very thin for lightness sake; and the *knée-timber* put together of divers small pieces, by reason of the inflexibleness of it, both which could not but render the *Ships* very weak: In the mean time, the perfection of these *hard materials* consists much in their receiving the most exquisite *politure*; and for this, *Lin-seed*, or the sweeter *Nut-oil* does the effect best: *Pliny* gives us the Receipt, with a decoction of *Walnut-shales*, and certain *wild pears*: Next to these, *Oak*, for *Ships*, and *Houses* (or more minutely) the *Oak* for the *Keel*, the *Robur* for the *Prow*, *Walnut* the *Stern*, *Elm* the *Pump*; *Furnerus* l. 1. c. 22. conceives the *Ark* to have been built of several woods; *Cornel*, *Holly*, &c. for *Pins*, *Wedges*, &c. *Chestnut*, *Horn-beam*, *Poplar*, &c. Then for *Bucklers*, and *Targets*, were commended the more soft and moist; because apt to close, swell, and make up their wounds again; such as *Willow*, *Lime*, *Birch*, *Alder*, *Elder*, *Ash*, *Poplar*, &c.

The *Robur*, or *Wild Oak Timber*, best to stand in ground; the *Quercus* without; and our *English*, for being least obnoxious to *splinter*, and the *Trifls* for resisting the *Worm* (tough as *leather*) are doubtless for *Shipping* to be prefer'd before all other: The *Cypress*, *Fir*, *Pines*, *Cedar*, &c. are best for *Posts*, and *Columns*, because of their erect growth, natural and comely diminutions. Then again it is noted, that *Oriental Trees* are hardest towards the *Cortex* or *Bark*; our *Western* towards the middle, which we call the *Heart*; and that *Trees* which bear *fruit*, or but little, are more durable than the more pregnant. It is noted of *Oak*, that the *knots* of an inveterate *Tree*, just where a lusty arm joyns to the *Stem*, is as curiously vein'd as the *Walnut*, which omitted in the *Chapter* of the *Oak*, I here observe. The *Palmeto* growing to that prodigious height in the *Barbadoes*, and whose top bears an excellently tasted *Cabbage*, grows so wonderfully hard, that an *Edge-Tool* will scarce be forced into it.

Pines, *Pitch*, *Alder*, and *Elm*, are excellent to make *Pumps* and *Conduit-pipes*, and for all *Water-works*, &c. *Fir* for *Beams*, *Bolts*, *Bars*; being tough, and not so apt to break as the hardest *Oak*: In sum, the more *odoriferous* *Trees* are the more durable and lasting; and yet I conceive that well season'd *Oak* may contend with any of them; especially, if either preserved under ground, or kept perfectly dry: In the mean time, as to its application in *shipping*, the best of it ought to be employ'd for the *Keel*, (that is, within, else *Elm* exceeds) the main *beams* and *rafters*, whilst for the ornamental parts, much slighter *Timber* serves: One note more is requisite, namely, that great care be had to make the *Trundels* of the best, toughest, and sincerest part, many a *Vessel* having been lost upon this account; and therefore dry, and young *Timber* is to be prefer'd for this, and for which the *Hollanders* are plentifully furnish'd out of *Ireland*, as *Nicholas Witsen* has himself acknowledged.

16. Here farther for the uses of *timber*, I will observe to our Reader some other *Particulars* for direction both of the *seller* and *Buyer*,

Buyer, applicable to the several *Species*: And first of the two sorts of *Lathes* allow'd by Statute, one of *five*, the other of *four foot* long, because of the different *Intervals* of *Rafters*: That of *five* has 100 to the *Bundle*, those of *four* 120; and to be in breadth 1 *Inch* and $\frac{1}{2}$, and half *Inch* thick; of either of which sorts there are three, viz. *Heart-oak*, *Sap-Lathes*, and *Deal Lathes*, which also differ in *Price*: The *Heart-oak* are fittest to lie under *tyling*, the second sort, for *plastering* of *side-walls*, and the third for *Ceilings*, because they are freights and even.

17. Here we will gratify our *curious Reader* with as curious an *Account* of the *Comparative strength*, and *fortitude* of the several usual sorts of *timber*, as upon *Suggestions* previous to this *Work*, it was several times *Experimented* by the *Royal Society*, though omitted in the first *Impression*, because the *tryals* were not complete as they now thus stand in our *Register*.

March 23. 1663.

The *Experiment* of breaking several sorts of *Wood* was begun to be made: And there were taken three pieces of several kinds; of *Fir*, *Oak*, and *Ash*. each an *Inch* thick, and two *foot* long, the *Fir* weigh'd 8 $\frac{1}{2}$ *Ounces*, and was broken with 200 *l*. weight: The *Oak* weigh'd 12 $\frac{1}{2}$, broken with 250 weight: the *Ash* weigh'd 10 $\frac{1}{2}$, broken with 325 weight.

Besides there were taken 3 pieces of the same sorts of *wood* each of $\frac{1}{2}$ *inch* thick, and 1 *foot* long: the *Fir* weigh'd $\frac{1}{2}$, and was broken with $\frac{1}{2}$ of an 100: The *Oak* weigh'd $\frac{1}{2}$, broken with $\frac{1}{2}$ of an 100: the *Ash* weigh'd $\frac{1}{2}$, broken with 100 *l*.

Again, there was a piece of *Fir*: $\frac{1}{2}$ *Inch* square, and two *foot* long, broken with 33 *l*. A piece of $\frac{1}{2}$ *Inch* thick, 1 *Inch* broad, and 7 *foot* long, broken with 100 weight edge-wise; And a piece of $\frac{1}{2}$ *inch* thick, $\frac{1}{2}$ broad, 2 *foot* long, broken with 225 weight, also edge-wise.

The *Experiment* was order'd to be repeated by the *President*, to Sir *William Petty*, and Mr. *Hook*; and it was suggested by some of the *Company*, that in these *tryals* consideration might be had of the age, *knottiness*, *solidity*, several *soils*, and parts of *trees*, &c. and Sir *Robert Morray* did particularly add, that it might be observ'd how far any kind of *Wood bends* before it breaks.

March — 64.

The *Operator* gave an *Account* of more pieces of *wood* broken by weight, viz. a piece of *Fir* 4 *foot* long 2 *Inches*, 53 *Ounce* weight, broken with 800 *l*. weight, and very little bending, with 750; by which the *Hypothesis* seems to be confirm'd, that in similar pieces, the *Proportion* of the *breaking-weight* is according to the *basis* of the *wood broken*: Secondly, of a piece of *Fir* 2 *foot* long, 1 *Inch* square, cut away from the middle both ways to half an *Inch*, which supported 250 *l*. weight before it broke, which is

D d 2 more

more by 50 l. than a piece of the same *thickness* every way was formerly broken with; the difference was guessed to proceed from the more firmness of this other piece.

His Lordship the President, was desir'd to contribute to the Prosecution of this Experiment, and particularly, to consider what *line* a Beam must be cut in, and how *thick* it ought to be at the *Extream*, to be equally strong: Which was brought in April 13, but I find it not enter'd.

April 20. 1664.

The Experiment of breaking Wood was prosecuted, and there were taken two pieces of Fir, each two foot long, and 1 Inch square, which were broken, the one long-ways with 300 l. weight, the other transverse-ways with 2 hundred: Secondly, two pieces of the same wood, each of $\frac{1}{2}$ of an Inch square, and two foot long, broken, the one long-ways with 1 hundred; the other transverse with 100 l. weight: Thirdly, one piece of 2 foot long 1 Inch square, broken long-ways with 81 l. Fourthly, one piece cut out of a crooked Oak-billet, with an arching Grain, about $\frac{1}{2}$ Inch square, two foot long, broken with 2 hundred.

June 29. 1664.

There were made several Experiments more of breaking wood: First, a piece of Fir 1 Inch diameter, and 3 Inches long, at which distance the weight hung, broke in the Plane of the Grain horizontally, with 66 l. whereof 15 l. Troy; Vertically, with 2 l. more. Also Fir of a 1 Inch diameter, and 1 Inch long, broke vertically with 20 l. and horizontally, with 19 l. Elm of $\frac{1}{2}$ Inch diameter, and three Inches long, broke horizontally, with 47 l. Vertically with 23 l. Elm of $\frac{1}{2}$ Inch diameter, and 1 Inch long, broke horizontally with 12 l. Vertically with 10 l. which is Note worthy.

July 6. 1664.

The Experiment of breaking Woods prosecuted: A piece of Oak of 1 Inch diameter and three Inches long, at which distance the weight hung, broke horizontally with 48 l. Vertically with 40 l. Ash of $\frac{1}{2}$ Inch diameter, and 3 Inch long, horizontally with 77 l. Vertically, with 75 l. Ash of $\frac{1}{2}$ Inch diameter, and 1 Inch long, horizontally with 19 l. Vertically, with 12 l. &c. Thus far the Register. In the mean time I learn that in the Mines of Mendip pieces of Timber of but the thickness of a mans arm, will support 10 Tun of Earth; and that some of it has lain 200 years, which is yet as firm as ever, growing tough and black, and being expos'd two or three days to the Wind and Sun, scarce yields to the Ax.

18. Here might come in the Problems of Cardinal Cusa in Lib. 4. *Idiota dial.* 4^{to} concerning the different velocity of the Ascent of great pieces of Timber, before the smaller, submerged in water; as also

also of the weight; as v. g. Why a piece of Wood 100 l. weight, poising more in the Air than 2 l. of Lead, the 2 l. of Lead should seem to weigh (he should say Sink) more in the Water? Why Fruits being cut off from the Tree, weigh heavier, than when they were growing? with several the like Paradoxes, haply more curious than useful, and therefore we purposely omit them; but so may we not the recommendation of that useful Treatise of Duplicate proportion, together with a new Hypothesis of Elasticke or springy bodies, to shew the strengths of Timbers, and other homogeneous materials apply'd to Buildings, Machines, &c. as it is publish'd by that admirable Genius, the learned Sir William Petty. To which we joyn that part of Dr. Grews comparative Anatomy of Trunks, as variously fitted for Mechanical uses; where that most industrious and curious searcher into nature, describes to us whence Woods are soft, fast, hard, apt to be cleft, tough, durable, &c. Lastly,

19. Concerning Squar'd, and Principal Timber for any usual Building, these are the legal Proportions, and which Buildings ought not to vary from.

Summers or Glir- ders from	$\left\{ \begin{array}{l} \text{F. R.} \\ 14 \quad 16 \\ 18 \quad 20 \\ 20 \quad 23 \\ 23 \quad 26 \\ 25 \quad 28 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{In length,} \\ \text{must be} \\ \text{in their} \\ \text{Square.} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{In. In.} \\ 11 \quad 8 \\ 13 \quad 9 \\ 14 \quad 10 \\ 16 \quad 12 \\ 17 \quad 14 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{Feet} \\ \text{of Joists} \\ 11 \frac{1}{2} \\ 10 \frac{1}{2} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{In length} \\ \text{must be} \\ \text{in their} \\ \text{Square} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{Inch} \quad \text{Inch} \\ 8 \quad 3 \\ 7 \quad 3 \\ 6 \quad 3 \end{array} \right\}$
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binding Joists & Trimm- ing from	$\left\{ \begin{array}{l} \text{F. F.} \\ 7 \quad 10 \\ 11 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{In length} \\ \text{must be} \\ \text{in their} \\ \text{Square} \end{array} \right\}$	$\left\{ \begin{array}{l} 6 \quad 5 \\ 7 \quad 5 \\ 8 \quad 5 \end{array} \right\}$	Wall-platts and Beams of any length, from 5 foot, may have in their square —	$\left\{ \begin{array}{l} \text{Inch} \quad \text{Inch} \\ 15 \quad 7 \\ 10 \quad 6 \\ 8 \quad 4 \end{array} \right\}$
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Parlours from	$\left\{ \begin{array}{l} \text{F. F.} \\ 15 \quad 10 \\ 18 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{In length, must} \\ \text{have in their} \\ \text{Square} \end{array} \right\}$	$\left\{ \begin{array}{l} 9-8 \\ 12-9 \end{array} \right\}$
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Principal Rafters cut Taper from	$\left\{ \begin{array}{l} \text{F. F.} \\ 12 \quad 14 \\ 14 \quad 18 \\ 18 \quad 21 \\ 21 \quad 24 \\ 24 \quad 26 \end{array} \right\}$	$\left\{ \begin{array}{l} \text{In length} \\ \text{must have} \\ \text{in their} \\ \text{Square on} \\ \text{one side} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{In. In.} \\ 8 \quad 5 \\ 9 \quad 7 \\ 10 \quad 8 \\ 12 \quad 9 \\ 9 \quad 9 \end{array} \right\}$	on the other side	$\left\{ \begin{array}{l} 6 \quad 5 \\ 7 \quad 7 \\ 8 \quad 8 \\ 9 \quad 9 \end{array} \right\}$	single Rafters in length from 6 $\frac{1}{2}$ to 9 $\frac{1}{2}$	$\left\{ \begin{array}{l} \text{F. must} \\ \text{have in} \\ \text{their} \\ \text{sq.} \end{array} \right\}$	$\left\{ \begin{array}{l} 5-3 \frac{1}{2} \\ 8 \\ 5-4 \end{array} \right\}$
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Principal Discharges of any length from	$\left\{ \begin{array}{l} \text{Foot} \\ 10 \\ \text{upward} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{must have} \\ \text{in their} \\ \text{Square} \end{array} \right\}$	$\left\{ \begin{array}{l} \text{Inch} \quad \text{Inch} \\ 13-12 \\ 16-13 \end{array} \right\}$
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But Carpenters also work by Square, which is 10 foot in Framing and Erecting the Carcase (as they call it) of any Timber Edifice, which is valued according to the goodness and choice of the Materials, and curiosity in Framing; especially Roofs and Staircases, which are of most charges. And here might also something be added concerning the manner of framing the Carcases of Buildings, as of Floors, pitch of Roofs, the length of Hips, and Sleepers, together with the names of all those several Timbers used in Fabrics totally consisting of Wood; but I find it done to my hand,

band, and Publish'd some years since, at the end of a late Translation of the *first Book of Palladio*, to which I refer the Reader. And to accomplish out *Artists* in *Timber*, with the utmost which that *material* is capable of; to the Study and Contemplation of that stupendous *Roof*, which now lies over the ever renowned *Sheldonian Theatre* at the *University of Oxford*; being the sole Work and Contrivement of that my most Honoured Friend Sir *Chr. Wren*, now worthily dignified with the *Superintendency* of his *Majesties Buildings*. See Dr. *Plot's* description of it in his *Nat. Hist. of Oxfordshire*, p. 272, 273. Tab. 13, 14. also *D. Wallis de Motu* part 3. de *veſte* cap. 6. prop. 10.

20. We did, in *Chap. 21.* mention certain *Subterranean Trees*, which Mr. *Cambden* suppoſes grew altogether under the ground: And truly, it did appear a very *Paradox* to me, till I both ſaw, and diligently examin'd that piece (*Plank, Stone*, or both ſhall I name it) of *Lignum ſoffile* taken out of a certain *Quarry* thereof at *Aqua Sparta* not far from *Rome*, and ſent to the moſt incomparably learned Sir *George Ent*, by that obliging *Virtuoſo Cavalier dal Pozzo*. He that ſhall examine the *hardneſs*, and feel the *ponderousneſs* of it, ſinking in *water*, &c. will eaſily take it for a *ſtone*; but he that ſhall behold its *grain*, ſo exquisitely *undulated*, and varied, together with its *colour*, manner of *hewing*, *chips*, and other moſt perfect reſemblances, will never ſcruple to pronounce it arrant *wood*.

Signor Stelluti (an *Italian*) has publiſh'd a whole *Treatiſe* expreſſly to deſcribe this great *Curioſity*: And there has been brought to our notice, a certain *relation* of an *Elm* growing in *Bark ſhire* near *Farringdon*, which being cut towards the *Root*, was there plainly *Petrified*; the like, as I once myſelf remember to have ſeen in another *Tree*, which grew quite through a *Rock* near the *Sepulchre* of *Agrippina* (the *Mother* of that *Monſter Nero*) at the *Baiaby Naples*, which appear'd to be all *Stone*, and trickling down in drops of *Water*, if I forget not. But, while others have *Philophiz'd* according to their manner upon theſe extraordinary *Concretions*; ſee what the moſt induſtrious, and knowing Mr. *Hook*, *Curator* of this *Royal Society*, has with no leſs *Reason*, but more ſuccinctneſs, obſerv'd from a late *Microſcopical* Examen of another piece of *petrified wood*; the Deſcription, and Ingenuity whereof cannot but gratifie the *Curious*, who will by this *Inſtance*, not only be inſtructed how to make *Inquiries* upon the like *occasions*; but ſee alſo with what *accurateness* the *Society* conſtantly proceeds in all their *Indagations*, and *Experiments*; and with what *Candor* they relate, and communicate them.

21. "It reſembled *wood*, in that

"*Fiſt*, all the parts of the *petrif'd* ſubſtance ſeem'd not at all diſlocated, or alter'd from their natural poſition while they were *wood*; but the whole piece retain'd the exact ſhape of *wood*, having many of the conſpicuous *pores* of *wood* ſtill remaining *pores*, and ſhewing a manifeſt difference viſible enough between the *grain* of the *wood* and that of the *bark*; eſpecially, when any ſide of it was cut ſmooth and polite; for then it appear'd

"to

"to have a very lovely *grain*, like that of ſome curious cloſe *wood*.

"*Next* (it reſembled *wood*) in that all the ſmaller, and (if ſo I may call thoſe which are only to be ſeen by a good glaſs) *microſcopical* pores of it, appear (both when the ſubſtance is cut and *poliſh'd tranſverſly*, and *parallel* to the pores) perfectly like the *Microſcopical* pores of ſeveral kinds of *wood*, retaining both the *ſhape*, and poſition of ſuch pores.

"It was differing from *wood*,

"*Fiſt*, in *weight*, being to common *water*, as 3; to 1. whereas there are few of our *Engliſh* woods that, when dry, are found to be full as heavy as *water*.

"*Secondly*, in *hardneſs*, being very near as hard as a *ſlint*, and in ſome places of it alſo reſembling the grain of a *ſlint*: it would very readily cut *Glaſs*, and would not without difficulty (eſpecially in ſome parts of it) be ſcratch'd by a black hard *ſlint*: it would alſo as readily ſtrike *fire* againſt a *Steel*, as alſo againſt a *ſlint*.

"*Thirdly*, in the *cloſeneſs* of it; for, though all the *microſcopical* pores of the *wood* were very conſpicuous in one poſition, yet by altering that poſition of the poliſh'd ſurface to the light, it alſo was manifeſt that thoſe pores appear'd darker than the reſt of the body, only becauſe they were fill'd up with a more duſky ſubſtance, and not becauſe they were hollow.

"*Fourthly*, in that it would not *burn* in the *fire*; nay, though I kept it a good while red-hot in the flame of a *Lamp*, very intently caſt on it by a *blaſt* through a ſmall *pipe*; yet it ſeem'd not at all to have diminish'd its extenſion; but only I found it to have chang'd its colour, and to have put on a more dark, and duſky brown hue. Nor could I perceive that thoſe parts which ſeem'd to have been *wood* at fiſt, were any thing waſted, but the parts appear'd as ſolid, and cloſe as before. It was farther obſervable alſo, that as it did not conſume like *wood*; ſo neither did it crack and fly like a *ſlint*, or ſuch like hard *ſtone*; nor was it long before it appeared red-hot.

"*Fiſthly*, in its *diſſolubleneſs*; for putting ſome drops of *diſtill'd Vinegar* upon the *ſtone*, I found it preſently to yield very many *bubbles*, juſt like thoſe which may be obſerved in *ſpirit of Vinegar* when it corrodes *Coral*; though I gueſs many of thoſe *bubbles* proceeded from the ſmall parcels of *Air*, which were driven out of the pores of this *petrif'd* ſubſtance, by the inſinuating liquor *menſtruum*.

"*Sixthly*, in its *Rigidneſs*, and *friability*; being not at all *flexible*, but *brittle* like a *ſlint*; inſomuch that with one knock of a *Hammer* I broke off a ſmall piece of it, and with the ſame *Hammer* quickly beat it to pretty fine *powder* upon an *Anvil*.

"*Seventhly*, it ſeem'd alſo very differing from *wood* to the touch, feeling more cold than *wood* uſually does, and much like other cloſe *ſtones* and *Minerals*.

"The *Reasons* of all which *Phænomena* ſeem to be:

"That

"That this petrified wood having lain in some place where it was well foked with petrifying water (that is, such a water as is well impregnated with stony and earthy particles) did by degrees separate, by straining and filtration, or perhaps by precipitation, co-hesion or coagulation, abundance of stony particles from that permeating water: which stony particles having, by means of the fluid Vehicle, convey'd themselves not only into the microscopical pores, and perfectly stop'd up them; but also into the pores, which may perhaps be even in that part of the wood which through the microscope appears most solid; do thereby so augment the weight of the wood, as to make it above three times heavier than water, and perhaps six times as heavy as it was when wood: next, they hereby so lock up and fetter the parts of the wood, that the fire cannot easily make them fly away, but the action of the fire upon them is only able to char those parts as it were, like as a piece of wood if it be closed very fast up in Clay, and kept a good while red hot in the fire, will by the heat of the fire be char'd, and not consum'd; which may perhaps be the reason why the petrified substance appear'd of a blackish brown colour after it had been burnt. By this intrusion of the petrified particles it also becomes hard, and friable; for the smaller pores of the wood being perfectly stuffed up with these stony particles, the particles of the wood have few or no pores in which they can reside, and consequently, no flexion or yielding can be caus'd in such a substance. The remaining particles likewise of the wood among the stony particles may keep them from cracking and flying, as they do in a fire.

22. The casual finding of Subterraneous-Trees has been the occasion of this curious Digression: Now it were a strange Paradox to affirm, that the Timber under the ground, should to a great degree, equal the value of that which grows above the Ground; seeing though it be far less, yet it is far Richer; the Roots of the vilest Shrub, being better for its toughness, and for Ornament, and delicate uses much more preferable than the Heart of the fairest and soundest Tree: And many Hills, and other waste-places, that have in late and former Ages been stately Groves and Woods, have yet this Treasure remaining, and perchance sound and unperish'd, and commonly (as we observ'd) an hindrance to other Plantations; Engines therefore, and Expedients for the more easily extracting these Cumbrances, and making riddance upon such Occasions, besides those we have produc'd, would be excogitated, and enquir'd after, for the dispatch of this difficult Work.

Fuel.

23. Finally, for the use of our Chimnies, and maintenance of fire, the plenty of wood for fuel, rather than the quality is to be looked after; and yet there are some greatly to be prefer'd before others, as harder, longer-lasting, better heating, and cheerfully burning; for which we have commended the Ash, &c. in the foregoing Paragraphs, and to which I pretend not here to add much, for the avoiding repetitions; though even an History of the best way of Charring would not misbecome this Discourse.

But something more is to be said sure, concerning the selling of Fuel.

Fuel-wood: Note therefore, that you first begin with the under-wood: Some conceive between *Marle-mas* and *Holy-Rood*; but, generally with *Oaks* as soon as 'twill strip, but not after *May*; and for *Ashes*, 'twixt *Michael-mas* and *Candlemas-mas*; and so sell'd, as that the Cattel may have the browsing of it, for in Winter they will not only eat the tender twigs, but even the very Moss; but sell no more in a day than they can Eat for this purpose: This done, kid or bavin them, and pitch them upon their ends to preserve them from rotting: Thus the Under-wood being dispos'd of, the rest will prosper the better, and besides it otherwise does but rot upon the Earth, and destroy that which would spring. If you head, or top for the fire, 'tis not amiss to begin three or four foot above the Timber, if it be considerable; but in case they are only Shaken-Trees and Hedge-rows, strip them even to thirty foot high, because they are usually full of boughs; and 'twere good to top such as you perceive to wither at the tops a competent way beneath, to prevent their sickness downwards, which will else certainly ensue; whereas by this means even dying Trees may be preserved many years to good emolument, though they never advance taller; and being thus frequently shred, they will produce more, than if suffer'd to stand and decay: This is a profitable note for such as have old, doating, or any ways infirm Woods: In other Fellings, some advise never to commence the disbranching from the top, for though the incumbency of the very boughs upon the next, cause them to fall off the easier, yet it endangers the splicing of the next, which is very prejudicial, and therefore advise the beginning at the nearest. And in Cutting for fuel you may as at the top, so at the sides, cut a foot, or more from the Body; but never when you shred Timber-Trees: We have said how dangerous it is, to cut for fire-wood when the Sap is up, it is a mark of improvident Husbands; besides it will never burn well, though abundance be congested: Lastly, remember that East and North-winds are unkind to the succeeding Shoots. Now for directions in Stacking (of which we have said something in Chap. of Coppices) ever set the lowest course an end, the second that on the sides and ends, viz. sides and ends outward; the third thwart the other on the side, and so the rest, till all are placed, spending the up-moist first.

Thus we have endeavour'd to prescribe the best directions we could learn concerning this necessary Subject. And in this penury of that dear Commodity, and to incite all ingenious persons, studious of the benefit of their Country, to think of ways how our Woods may be preserv'd, by all manner of Arts which may prolong the lasting of our fuel, I would give the best encouragements. Those that shall seriously consider the intolerable misery of the poor *Cauchi* (the then Inhabitants of the Low-Countries) describ'd by *Pliny*, lib. 16. cap. 1. (how opulent soever their late Industry has render'd them) for want only of wood for fuel, will have reason to deplore the excessive decay of our former store of that useful Commodity; and by what shifts our Neighbours the *Hollanders*, do yet repair that defect, be invited to exercise their ingenuity:

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For besides the *Dung* of *Beasts*, and the *Peat* and *Turf* for their *Chimneys*, *Cow sheards*, &c. they make use of *Stoves* both portable and standing; and truly the more frequent use of those *Inventions* in our great, wasting *Cities* (as the Custom is through all *Germany*) as also of those new, and excellent *Ovens* invented by *Dr. Kessler*, for the incomparably baking of *Bread*, &c. would be an extraordinary expedient of husbanding our *fuel*; as well as the right mingling, and making up of *Char-coal-dust*, and *loam*, as 'tis hinted to us by *Sir Hugh Plat*, and is generally us'd in *Maeſſricht*, *Liege* and the *Country* about it; than which there is not a more sweet, lasting, and beautiful *fuel*; The manner of it is thus:

24. Take about one *third part* of the smallest of any *Coals*, *Pit*, *Sea*, or *Char-coal*, and commix them very well with *loam* (whereof there is in some places to be found a sort somewhat more combustible) make these up into *balls* (moistened with a little *Urine* of *Man* or *Beast*) as big as an ordinary *Goose-egge*, or somewhat bigger; or if you will in any other form, like *brick-bats*, &c. expose these in the *Air* till they are thoroughly dry; they will be built into the most orderly *fires* you can imagine, *burn* very clear, give a wonderful heat, and continue a very long time. But first you must make the *fire* of *Char-coal*, or *Small-coal*, covering them with your *Eggs*, *Hot-pots* or *Hovilles* (as they are call'd) and building them up in *Pyramids*, or what shape you please, they will continue a glowing, solemn and constant *fire* for seven or eight *hours* without being stirred, and then they encourage and recruit the innermost with a few fresh *Eggs*, and turn the rest, which are yet quite reduc'd to *Cinders*; and this mixture is devis'd to slacken the impetuous devouring of the *fire* and to keep the *Coals* from consuming too fast.

Two or three short *Billets* cover'd with *Char-coal* last much longer, and with more life, than twice the quantity by it self, whether *Char-coal* alone, or *Billet*; and the *Billets* under the *Charcoal* being undisturb'd, will melt as it were into *Char-coals* of such a lasting size.

If *Small-coals* be spread over the *Char-coal*, where you burn it alone, 'twill bind it to longer continuance; and yet more, if the *Small-coal* be made of the *roots* of *Thorns*, *Briers*, and *Brambles*. Consult *L. Bacon*, Exp. 775.

25. The *Quercus Marina*, *Wrack*, or *Sea-weed* which comes in our *Oyster-barrels*, laid under *New-Castle-coal* to kindle it (as the use is in some places) will (as I am inform'd) make it out-last two great *fires* of simple *Coals*, and maintain a glowing *luculent* heat without waste. This sort of *Fuel* is much made use of in *Malta* and the *Islands* thereabout, especially to burn in their *Ovens*, and the *Peasants* who first brought it into custom I find highly commended by an *Author* as a great *Benefactor* to his *Country*: The manner of gathering it is to cut it in *Summer* time from the *Rock* whereon it grows abundantly, and bringing it in *Boats* or otherwise to Land, spread and dry it in the *Sun* like *hay*, turning and cocking it till it be fully cur'd. It makes an excellent *fire* alone, and *roasts* to admiration; and when all is burnt, the *Ashes* are one of the best *manures* for *Land* in the world, for the time it continues its

virtue,

virtue, which should be frequently supplied with fresh; and as to the *Fire* mingled with other *Combustibles*, it is evident that it adds much life, continuance and aid, to our *fullen Sea-coal Fuel*; and if the main *Ocean* should afford *Fuel* (as the *Bernacles* and *Solander-Geese* are said to do in some parts of *Scotland* with the very *sticks* of their *Nests*) we in these *Isles* may thank our selves if we be not warm: These few particulars I have but mention'd to animate *Improvements*, and ingenious Attempts of detecting more cheap, and useful *processes*, for ways of *Charing-Coals*, *Peat*, and the like *fuliginous* materials; as the accomplish'd Mr. *Boyl* has intimated to us in the *Fifth* of those his precious *Essays* concerning the *usefulness* of *Natural Philosophy*, Part 2. cap. 7. &c. to which I refer the Curious.

26. By the *Preamble* of the *Statute* 7 Ed. 6. one may perceive (the *Measures* compar'd) how plentiful *fuel* was in the time of *Ed.* the 4th, to what it was in the *Reigns* of his *Successors*: This suggested a review of *Sizes*, and a reformation of *Abuses*; in which it was Enacted, that every *Sack* of *Coals* should contain four *Bushels*; Every *Taleside* to be four foot long, besides the *carp*; and if nam'd of one, marked one, to contain 16 inches *circumference*, within a foot of the middle; If of two marks, 23 inches; of 3, 28; of 4, 35; of 5, 38. inches about, and so proportionably.

27. *Billets* were to be of three foot, and four inches in length: the single to be 17 inches and an half about; and every *Billet* of one *cast* (as they term the mark) to be ten inches about: of two *cast*, fourteen inches, and to be marked (unless for the private use of the *Owner*) within six inches of the middle: of one *cast* within four inches of the end, &c.

Every bound *Fagot* should be three foot long; the *band* twenty four inches *circumference*, besides the knot.

In the 43 Eliz. the same *Statute* (which before only concern'd *London* and its *Suburbs*) was made more universal; and that of *Ed.* 6. explain'd with this addition: For such *Talesides* as were of necessity to be made of *cleft-wood*, if of one mark, and half round, to be 19 inches about; if quarter-cleft 18 inches: Marked *two*, being round it shall be 23 inches compass: half-round 27: quarter-cleft 26: marked *three*, round 28: half-round 33: quarter-cleft 32: marked *four*, being round 33 inches about: half-round 39: quarter-cleft 38: marked *five* round, 38 inches about: half-round 44: quarter-cleft 43: the measure to be taken within half a foot of the middle of the length mention'd in the former *Statute*.

Then for the *Billet*, every one nam'd a *single*, being round, to have 7 inches' *circumference*; but no *single* to be made of *cleft wood*: If marked *one*, and round, to contain 11 inches compass: if half-round 13: quarter-cleft 12.

If marked *two*, being round, to contain 16 inches: half-round 19: quarter-cleft 18: the length as in the *Statute* of King *Edward* 6.

28. *Fagots* to be every stick of three foot in length, excepting

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only one stick of one foot long, to harden and wedge the binding of it: This, to prevent the abuse (too much practis'd) of filling the middle part, and ends with trash, and short sticks, which had been omitted in the former *Statute*: concerning *this* and of the *dimensions* of wood in the *Stack*, see *Chap. 28.* to direct the less instructed *Purchaser*: and I have been the more particular upon this occasion; because, than our *Fuel* bought in *Billet* by the *Notch* (as they call it in *London*) there is nothing more deceitful; for by the vile iniquity of *those Wretches*, marking the *billets* as they come to the *Wharf*, Gentlemen are egregiously cheated. I could produce an instance of a *Friend* of mine (and a *Member* of this *Society*) for which the *Wood-monger* has little cause to brag; since he never durst come at him, or challenge his *Money* for the *Commodity* he bought; because he durst not stand to the *measure*.

At *Hall* near *Foy*, there is a *Fagot*, which consists but of *one* piece of *Wood*, naturally grown in that form, with a *band* wrapped about it, and parted at the ends into *four* sticks, one of which is subdivided into *two* others: It was carefully preserved many years by an *Earl* of *Devonshire*, and looked on as portending the *fate* of his *Posterity*, which is fine: indeed come into the hands of *four* *Cornish* Gentlemen, one of whose *Estates* is likewise divided 'twixt *two* *Heirs*. This we have out of *Cambden*, and I here *note*, for the *Extravagancy* of the thing; though as to the verity of such *Portents* from *Trees*, &c. I do not find (upon enquiry, which I have diligently made of my *Lord Brevelton*) that there is any certainty of the rising of those *Logs* in the *Lake* belonging to that Noble *Person*, so as still to premonish the *Death* of the *Heir* of that *Family*, how confidently soever reported. Sometimes it has happen'd, but the *Tradition* is not constant. To this *Class* may be referred what is affirmed concerning the fatal *Prediction* of *Oaks* bearing strange *leaves*, which may be enquired of: And of *Accidents* *fascinating* the boughs, and branches of *Trees*, *Dr. Plot* takes notice in *Willows* and other soft woods, especially in an *Ash* at *Biffeter* uniformly wreath'd two or three times round: such a curiosity also hangs up in the *Portic* of the *Physick-Garden* at *Oxford*, in a top-branch of *Holly*, which shews it likewise happening sometimes even to harder woods, and 'tis probable that such as we sometimes find so *helically* twisted, have receiv'd some blast, that has contracted the *Fibers*, and curl'd them in that extravagant manner.

29. But I will now describe to you the *Mystery* of *Charing* (where-of something was but touch'd in the *Process* of extracting *Tar* out of the *Pines*) as I receiv'd it from a most industrious *person*, and so conclude the *Chapter*.

There is made of *Char-coal* usually *three* sorts, *viz.* one for the *Iron-works*, a second for *Gun-powder*, and a third for *London* and the *Court*, besides *Small-coals*, of which we shall also speak in its due place.

We will begin with that sort which is us'd for the *Iron-works*, because the rest are made much after the same manner, and with very little difference.

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The best *Wood* for this is good *Oak*, cut into lengths of *three* foot, as they size it for the *stack*: This is better than the *Cord-wood*, though of a large measure, and much us'd in *Essex*.

The *Wood* cut, and set in *Stacks* ready for the *Coaling*, chuse out some level place in the *Coppice*, the most free from stubs, &c. to make the *Hearth* on: In the midst of this *area* drive down a stake for your *Centre*, and with a *pole*, having a *ring* fasten'd to one of the extreams (or else with a *Cord* put over the *Centre*) describe a *Circumference* from twenty, or more feet *semidiameter*, according to the quantity of your *Wood* design'd for *Coaling*, which being near, may conveniently be *Chared* in that *Hearth*; and which at one time may be 12, 16, 20, 24, even to 30 *stack*: If 12 therefore be the quantity you will *Coal*, a *Circle* whole *diameter* is 24 foot, will suffice for the *Hearth*; If 20 *stack*, a *diameter* of 32 foot; If 30, 40 foot, and so proportionably.

Having thus marked out the ground, with *Mattocks*, *Haws*, and fit *Instruments*, bare it of the *Turf*, and of all other combustible stuff whatsoever, which you are to rake up towards the *Peripherie*, or out-side of the *Circumference*, for an *use* to be afterwards made of it; plaining, and levelling the ground within the *Circle*: This done, the *Wood* is to be brought from the nearest parts where it is *stack'd*, in *Wheel-barrows*; and first the smallest of it plac'd at the utmost limit, or very margin of the *Hearth*, where it is to be set long-ways, as it lay in the *stack*; the biggest of the *Wood* pitch, or set up on end round about against the *small-wood*, and all this within the *circle*, till you come within five, or six foot of the *Centre*; at which distance you shall begin to set the *Wood* in a *Triangular* form (as in the following *Print*, a) till it come to be three foot high: Against *this* again, place your greater *Wood* almost perpendicular, reducing it from the *Triangular* to a *circular* form, till being come within a yard of the *Centre*, you may Pile the *Wood* long-ways, as it lay in the *stack*, being careful that the ends of the *Wood* do not touch the *Pole*, which must now be erected in the *Centre*, nine foot in height, that so there may remain a round *hole*, which is to be form'd in working up the *Stack-wood*, for a *Tunnel* and the more commodious *fring* of the *pit*, as they call it, though not very properly. This provided for, go on to *Pile*, and set your *Wood* upright to the other, as before; till having gain'd a yard more, you lay it long-ways again, as was shew'd: And thus continue the *Work*, still interchanging the *position* of the *Wood*, till the whole *Area* of the *Hearth* and *Circle* be fill'd, and pil'd up at the least *eight* foot high, and so drawn in by degrees in *Piling*, that it resemble the form of a *copped* brown *Houhold-loaf*, filling all inequalities with the smaller *Trunchions*, till it lye very close, and be perfectly, and evenly shaped. This done, take *straw*, *haume*, or *fern*, and lay it on the out-side of the bottom of the *heap*, or *wood*, to keep the next *cover* from falling amongst the *sticks*: Upon *this*, put on the *Turf*, and cast on the *dust* and *Rubbish* which was grubb'd, and raked up at the making of the *Hearth*, and reserved near the *circle* of it; with *this* cover the whole *heap* of *Wood*.

Wood to the very top of the *Pit*, or *Tunnel*, to a reasonable, and competent thickness, beaten close and even, that so the *fire* may not *vent* but in the places where you intend it; and if in preparing the *Hearth*, at first, there did not rise sufficient *Turf* and *Rubbish* for this Work, supply it from some convenient place near to your *heap*: There be who cover this again with a *sandy*, or *finer* mould, which if it close well, need not be above an *inch* or two thick: This done, provide a *screen*; by making light *hurdles* with *split rods*, and *straw* of a competent thickness, to keep off the *Wind*, and broad, and high enough to defend an opposite side to the very top of your *Pit*, being eight or nine foot; and so as to be easily remov'd as need shall require for the *living* of your *pit*.

When now all is in this posture, and the *Wood* well rang'd, and clos'd, as has been directed, set *fire* to your *heap*: But first you must provide you of a *Ladder* to ascend the top of your *Pit*: this they usually make of a curved *Tiller* fit to apply to the *convex* shape of the *Heap*, and cut it full of notches for the more commodious setting their Feet, whiles they govern the *Fire* above; therefore now they pull up, and take away the *Stake* which was erected at the *centre* to guide the building of the *Pile*, and cavity of the *Tunnel*. This done, put in a quantity of *Char-coals* (about a *peck*) and let them fall to the bottom of the *Hearth*; upon them cast in *coals* that are fully kindled; and when those which were first put in are beginning to sink, throw in more *fuel*; and so, from time to time, till the *Coals* have universally taken *fire* up to top: Then cut an ample and reasonable thick *Turf*, and clap it over the hole, or *mouth* of the *Tunnel*. Stopping it as close as may be with some of the former dust and rubbish: Lastly, with the handles of your *Rakers*, or the like, you must make *Vent-holes*, or *Registers* (as our *Chymists* would name them) through the stuff which covers your *Heap* to the very *Wood*, these in rangers of two or three foot distance quite round within a foot (or thereabout) of the *top*, though some begin them at the *bottom*: A day after, begin another row of *holes* a foot and half beneath the former; and so more, till they arrive to the ground, as occasion requires. Note, that as the *Pit* does *coal* and *sink* towards the *centre*, it is continually to be fed with short, and fitting *Wood*, that no part remain *unfir'd*; and if it *chars* faster at one part than at another, there close up the *vent-holes*, and open them where need is: A *Pit* will in this manner be burning off, and *charing*, five, or six days, and as it *coals*, the *smoke* from thick and gross clouds, will grow more blue, and livid, and the whole mass sink accordingly; so as by these indications you may the better know how to stop, and govern your *spiracles*. Two or three days it will only require for *cooling*, which (the *vents* being stopp'd) they assist, by taking now off the outward covering with a *Rake* or *Rubber*; but this, not for above the space of one *yard* breadth at a time; and first they remove the coarsest, and grossest of it, throwing the finer over the *heap* again, that so it may neither *cool* too hastily, nor endanger the *burning* and reducing all to *Ashes*. should the whole *Pit* be uncover'd and expos'd to the *Air* at once; therefore they open it thus round by degrees.

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When now by all the former *Symptoms* you judge it fully *char'd*, you may begin to *draw*; that is, to take out the *Coals*, first round the bottom, by which means the *Coals*, *Rubbish* and *Dust* sinking and falling in together may choke, and extinguish the *fire*. Your *Coals* sufficiently *cool'd*, with a very long-tooth'd *Rake*, and a *Vann*, you may load them into the *Coal-Wains*, which are made close with boards, purposely to carry them to *Market*: Of these *Coals* the grosser sort are commonly reserv'd for the *Forges*, and *Iron-works*; the middling and smoother put up in *Sacks*, and carried by the *Colliers* to *London* and the adjacent *Towns*; those which are *char'd* of the *Roots*, if pick'd out, are accounted best for *Chymical* fires, and where a lasting and extraordinary *blast* is requir'd.

30. *Coal* for the *Powder Mills* is made of *Alder-wood* (but *Lime-tree* were much better, had we it in that plenty as we easily might) cut, *stack'd*, and set on the *Hearth* like the former: But first, ought the *wood* to be wholly *disbark'd* (which work is to be done about *Mid-summer* before) and being thoroughly dry, it may be *Coaled* in the same method, the *Heap* or *Pit* only somewhat smaller, by reason that they seldom *coal* above five, or six *stacks* at a time, laying it but *two lengths* of the *wood* one above the other, in form somewhat flatter on the *top* than what we have described. Likewise do they fling all their *Rubbish* and *Dust* on the *top*, and begin not to cover at the *bottom*, as in the former example. In like sort, when they have drawn up the *fire* in the *Tunnel*, and stopp'd it, they begin to draw down their *dust* by degrees round the *heap*; and this proportionably as it *fires*, till they come about to the *bottom*; all which is dispatch'd in the space of *two* days. One of these *Heaps* will *char* three score *Sacks* of *Coal*, which may all be carried at one time in a *Waggon*; and some make the *Court-coals* after the same manner. Lastly,

31. *Small-coals* are made of the *Spray*, and *Brush-wood* which is shripp'd off from the *branches* of *Copp'ce-wood*, and which is sometimes bound up into *Bavins* for this use; though also it be as frequently *char'd* without binding, and then they call it *cooming* it together: This, they place in some near *floor*, made level, and freed of incumbrances, where setting one of the *Bavins* or part of the *spray* on fire, two men stand ready to throw on *Bavin* upon *Bavin* (as fast as they can take *fire*, which makes a very great and sudden blaze) till they have burnt all that lies near the place, to the number (it may be) of five, or six hundred *Bavins*: But ere they begin to set *fire*, they fill great *Tubs* or *Vessels* with *water*, which stand ready by them, and this they dash on with a great *dish* or *scoop*, so soon as ever they have thrown on all their *Bavins*, continually plying the great *heap* of glowing *Coals*, which gives a sudden stop to the fury of the *Fire*, whiles with a great *Rake* they lay, and spread it abroad, and ply their casting of *Water* till on the *Coals*, which are now perpetually turn'd by two men with great *Shovels*, a third throwing on the *water*: This they continue till no more *Fire* appears, though they cease not from being very hot: After this,

this, they *shovel* them up into great *heaps*, and when they are thoroughly *cold*, put them up in *Sacks* for *London*, where they use them amongst divers *Artificers*, both to kindle greater *Fires*, and to temper, and *aneal* their several Works: Lastly, this is to be observ'd, that what *wood* yields the finest *Coal*, is more flexible, and gentle than that which yields the contrary.

32. The best *Season* for the fetching home of other *Fuel*, is from *June*; the *Ways* being then most dry, and passable, yet I know some good *Husbands* will begin rather in *May*; because *Fallowing*, and stirring of Ground for *Corn*, comes in the ensuing *Months*, and the *Days* are long enough, and *Swains* have then least to do.



b The Central Pole or place of the Tunnel with the Area making ready.

a The Wood plac'd about it in Triangle.

c The Coal-Wood pil'd up before it be covered with Earth.

d The Coal-pit or Pile fill'd.

33. And thus we have seen how for *House-boat*, and *Ship-boat*, *Flow-boat*, *Hey-boat*, and *Fire-boat*, the *Planting*, and *Propagation* of *Timber* and *Forest-Trees* is requisite, so as it was not for nothing, that the very *Name* (which the *Greeks* generally apply'd to *Timber*) ὕλη, by *Senecdoche*, was taken always *pro materia*; since we hardly find any thing in *Nature* more universally *useful*; or, in comparison with it, deserving the name of *Material*.

See for this Dr. Grew of the Vegetation of Plants, cap. 7.

34. Lastly, to complete this Chapter of the universal use of *Trees*, and the *Parts* of them, something I could be tempted to say concerning *Staves*, *Wands*, &c. their *Antiquity*, *Use*, *Divine*, *Demestick*,

mesick, *Civil*, and *Political*; the time of *Cutting*, manner of *Seasoning*, *Forming*, and other curious particulars (how dry soever the *Subject* may appear) both of *Delight* and *Profit*: but we reserve it for some more fit opportunity, and perhaps, it may merit a peculiar *Treatise*, as acceptable, as it will prove divertant. Instead of this, we will therefore gratify our *Reader* with some no inconsiderable *Secrets*: But first we will begin with a few plain *Directions* for such *Persons* and *Countrey Gentlemen*, as being far distant from, or unhandomely impos'd upon by common *Painters*, may be desirous to know how to *Stop*, *Prime*, and *Paint* their *Timber-work* at home, and save the *Expense* of *Work* by any of their *Servants* indu'd with an ordinary *Capacity*.

Putty to stop the *chaps* and *cracks* of wrought *Timber*, is made of *White*, and *Red-lead*, and some *Spanish-white* (not much) temper'd, and bruised with so much *Lin-seed Oyls* will bring it to the Consistence of a *Past*. Then,

Your first *Priming* shall be of *Oaker* and *Spanish-white*, very thinly ground: The *second* with the same, a little *Whiter*; but it matters not much. The *third* and last, with *White-lead* alone; some mingle a little *Spanish white* with it, but it is better omitted. If you desire it exquisite, instead of *Lin-seed Oyl*, use that of *Wal-nuts*: But the ordinary *Stone-colour* for gross work, expos'd to the *Air*, may be of less *Expense*, with the more ordinary *Oyl*, to which you may add a little *Char-coal* in the *Grinding*.

Blew, is made of *Indigo*, with a small addition of *Red-lead*, or *Verdigriese* for a *dryer*; unless you will use *drying-Oyl*, which is much preferable, and is made of *Lin-seed-Oyl* boil'd with a little *Umber* bruised small: I speak nothing here of *Smalt* and *Byce*, which is only done by *Strewing*.

Green, with *Verdigriese* ground with *Lin-seed-Oyl* pretty thick, and then temper'd with *Joyner's Vernish* in a glaz'd *Pot* of *Earth* (the best to preserve your *Colours* in) till it run somewhat thin; and just touch it with your *Brush*, when you lay it on, having *Prim'd* it the *second* time with *White*.

Note, that every *Primer* must be dry, before you go it over again.

If you will *Re-wale*, as they term it, and shadow, or Vein your *Stone-colour*, there is a *Colour* call'd *Shadowing-Black*; or you may now and then lightly touch it with a little *Red-lead*; or work with *Umber*.

It will also behove you to have a good smooth *Slat*, and a *Pibble Muller* well polish'd, which may be bought at *London*; as likewise a dozen of large, and lesser *Brushes*, and *Glaz'd Pots*; and to grind the *Colours* perfectly well. The *Spanish-white* requires little labour; the *Shadowing Black*, none at all.

When you have finish'd, wash your *Brushes* with warm *Water* and a little *sapo*: Preserve your *Oyl* in *Bladders*; and what *Colour* you leave, plunge the *Pots* into fair *Water*, so as they may stand a little cover'd in it, which will keep them from growing *dry*, till you have occasion for them. That you may not be altogether ig-

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norant of the charge, and Price of the Ingredients, which seldom varies:

Clear, and sweet *Lin-seed Oyl* is usually had for 4 s per Gallon. *Spruce-Oker*, of all sorts to *Prime* with, 3 s. per Pound. *Spanish-white*, for half a Penny: *White-lead* 3 d. per Pound. *Vert-de-Greece*, clean and bright, 3 s. per Pound. *Black* to shadow with, exceeding cheap. *Joiners Vernish*, 6 d. per Pound. So as for farther direction; of *White-lead* six pound, *Span. white* six pound, *Spruce-Oker* three pounds, *Vert-de-Greece* half a pound, *Vernish* one pound, *Shadowing-black* half a pound, &c. will serve one for a pretty deal of *Work*, and easily inform what quantities you should provide for a greater, or lesser occasion.

We will next impart a Receipt for a cheap *Black-dye*, such yet as no *Weather* will fetch out, and that may be of use both within and without doors, upon *Wainscot*, or any fine *Timber*, as I once apply'd it to a *Coach* with perfect success.

Take of *Galls*, grossly contus'd in a *Stone Morter*, one pound, boyl them in three quarts of *White-wine Vinegar* to the diminution of one part, two remaining: With this, rub the *Wood* twice over; Then, take of the *Silk-Dyers black*, liquid (cheap and easie to be had) a convenient quantity, mix it at discretion with *Lamp-black* and *Aqua vite*, sufficient to make it thin enough to pass a *Strainer*: With this, die over your *Work* again; and if at any time it be stain'd or spotted with dirt, &c. rubbing it only with a *Wollen cloth* dip'd in *Oyl*, it will not only recover, but present you with a very fair and noble *polish*. There is a *Black* which *Joyners* use to tinge their *Pear-tree* with, and make it resemble *Ebony*, and likewise *Fir*, and other *Woods* for *Cabinets*, *Picture-Frames*, &c. which is this.

Take *Log-wood* q. s. boyl it in ordinary *Lie*, and with this paint them over: when 'tis dry, work it over a second time with *Lamp-black* and strong *Size*: That also dry, rub off the dusty *Sootiness* adhering to it, with a soft *Brush*, or *Cloth*; then melt some *Bees-wax*, mixing it with your *Lamp black* and *Size*, and when this is cold, make it up into a *Ball*, and rub over your former *Black*: Lastly, with a *Polishing brush* (made of short stiff *Boars* Bristles, and fastned with *Wyre*) labour 'till the *Lustre* be to your liking. But,

The *black Putty*, wherewith they stop, and fill up *cracks* and *fissures*, in *Ebony*, and other fine *wood*, is compos'd of a part of the purest *Resin*, *Bees-wax*, and *Lamp-black*: This they heat and drop into the *Crannies*; then with an *hot Iron*, glaze it over, and being cold, scrape it even with a sharp *Chizel*, and after all, polish it with a *Brush* of *bents*, a *woollen-cloth*, *Felt*, and an *Hogs-hair Rubber*: Also *Mastic* alone, mingled with a proper *Colour* is of no less effect.

35. We conclude all, with that incomparable *Secret* of the *Japon* or *China-Vernishes*, which has hitherto been reserv'd so choicely among the *Virtuosi*; with which I shall suppose to have abundantly gratified the most curious employers of the finer *moods*.

Take

Take a Pint of *Spirit of Wine* exquisitely depleg'd, four Ounces of *Gum-Lac*, which thus cleanse: break it first from the sticks and rubbish, and roughly contusing it in a *Mortar*, put it to sleep in *Fountain water*, it'd up in a bag of course *Linnen*, together with a very small morsel of the best *Castile-sope*, for 12 hours; then rub out all the *impure* from it, to which add a little *Alum* and reserve it apart: The *Gum-lac* remaining in the bag, with one Ounce of *Sandrac* (some add as much *Mastic* and *White-Amber*) dissolve in a large *Matras* (well stopp'd) with the *Spirit of Wine* by a two days digestion, frequently agitating it, that it adhere not to the *Glass*: Then strain, and press it forth into a lesser *Vessel*; Some, after the first *Infusion* upon the *Aspes*, after twenty four hours, augment the *heat*, and transfer the *Matras* to the *Sand-bath*, till the *Liquor* begins to *stimper*; and when the upper part of the *Matras* grows a little hot, and that the *Gum-lac* is melted, which by that time (if the Operation be heeded) commonly it is, strain it through a *Linnen-cloth*, and press it twixt two sticks into the *glass*, to be kept for use, which it will eternally be, if well stopp'd.

The Application.

The *Wood* which you would *Vernish*, should be very clear, smooth, and without the least *freckle* or flaw; and in case there be any, stop them with a paste made of *Gum Tragacanth*, incorporated with what *Colour* you design: Then cover it with a *layer* of *Vernish* purely, till it be sufficiently drench'd with it: Then take seven times the quantity of the *Vernish*, as you do of *Colour*, and bruise it in a small earthen dish glaz'd, with a piece of hard *wood*, till they are well mingled: Apply this with a very fine and full *Pencil*; a quarter of an hour after, do it over again, even to three times successively; and if every time it be permitted to dry, before you put on the next, 'twill prove the better: Within two hours after these four *layers* (or sooner if you please) *Polish* it with *Presle* (which our *Cabinet-makers* call as I think, *Dutch-Reeds*) wet, or dry; nor much imports it, though in doing this, you should chance to discover any of the *wood*; since you are to pass it over four or five times as above; and if it be not yet smooth enough, *Presle* it again with the *Reeds*, but now very tenderly: Then rub it sufficiently with *Tripoly*, and a little *Oyl-Olive*, or *Water*: Lastly, cover it once or twice again with your *Vernish*, and two days after, polish it as before with *Tripoly*, and a piece of *Hatters Felt*.

The Colours.

To make it of a fair *Red*, Take *Spanish Vermilion*, with a quarter part of *Venice Lack*.

For *Black*, *Ivory* calcin'd (as *Chymists* speak) twixt two well luted *Crucibles*, which being ground in *water*, with the best and greenest *Coppas*, and so let dry, reserve.

F f 2

For

For *Blue*, take *Ultramarine*, and only twice as much *Vernish*, as of *Colour*. The rest, are to be appl'd like the *Red*, except it be the *Green*, which is hard to make fair and vivid, and therefore seldom used.

Note. The right *Japon*, is done with three or four *Layers* of *Vernish* with the *Colours*; then two of pure *Vernish* un-colour'd (which is made by the former *Process*, without the *Sandrac* which is only mingled and used for *Reds*) which must be done with a swift, and even stroke, that it may not dry before the *Aventurin* be sifted on it; and then you are to cover it with so many *Layers* of pure *Vernish*, as will render it like polish'd *Glass*. Last of all fourthly with *Tripoly*, *Oyl*, and the *Felt*, as before directed. *Note*.

By *Venturine* is meant the most delicate, and slender *Golden-wyre* such as *Embroiderers* use, reduc'd to a kind of powder, as small as you can file or clipp it: this strew'd upon the first *Layer* of pure *Vernish*, when dry, superinduce what *Colour* you please; and this is prettily imitated with several *Talkes*.

This being the first time that to rare a *Secret* has been imparted (and which since the first publication of it, has been so successfully improv'd amongst our *Cabinet-makers* here in *London*) the *Reader* will believe that I envy him nothing which may be of use to the *Publicke*: And though many years since we were *Master* of this *Curiosity*, *Athanasius Kereber* has set down a *Process* in his late *China Illustrata* pretty faithfully; yet, besides that it only speaks *Latine* (such as 'tis) it is nothing so perfect as ours. However, there we learn, that the most opulent *Province* of *Chekiang* is for nothing more celebrated, than the excellent *Paper* which it produces, and the *Gumme* call'd *Giè* (exstiling from certain *Trees*) with which they compose their famous *Vernish*, so universally valu'd over the *World*; because it is found above all other *Inventions* of that nature, to preserve, and beautify *wood*, above any thing which has hitherto been detected: And it has accordingly so generally obtained with them, that they have whole *Rooms* and ample *Chambers*, waincotted therewith, and divers of their most precious *Furniture*; as *Cabinets*, *Tables*, *Stools*, *Beds*, *Dishes*, *Skreens*, *Staves*, *Frames*, *Pots*, and other *Utensils*: But long it was ere we could for all this, approach it in *Europe* to any purpose, till F. *Enfichius* *Imart* an *Angustine-Monk*, obtain'd the *Secret*, and oblig'd us with it.

I know not whether it may be any Service to speak here of *Colour'd Woods*, I mean such as are naturally so, because besides the *Berberis* for *Tellow*, *Holly* for *White*, and *Plum-tree* with *quicklime* and *Urine*, for *red*, we have very few: Our *Inlayers* use *Fustic*, *Locust*, or *Acacia*; *Brassie*, *Prince* and *Rose-wood* for *Tellow* and *Reds*, with several others borrow'd from both the *Indies*; but when they would imitate the natural turning of *Leaves* in their curious *Compartiments* and borders of *Flower works*, they effect it by dipping the pieces (first cut into shape and ready to *In-lay*) so far into hot *Sand*, as they would have the *Shadow*, and the heat of the *Sand* darkens it so gradually, without detriment or burning

ing the thin *Chip*, as one would conceive it to be natural: *Note*, that the *Sand* is to be heat'd in some very thin *Brass-pan*, like to the bottom of a *Scale* or *Balance*: This I mention, because the burning with *Trons*, or *Aqua-fortis*, is not comparable to it.

I learn also, that *soft Woods* attain little politure without infinite labour, and the expedient is, to *Plane* it often, and every time you do so, to smear it with strong *Glew*, which easily penetrating, hardens it; and the frequenter you do this, and still *Plane* it, the harder, and sleeker it will remain.

And now we have spoken of *Glew*, 'tis so common and cheap, that I need not tell you it is made by boyling the *sinues*, &c. of *Sheeps-trotters*, parings of *raw Hides*, &c. to a *Gelly*, and straining it: But the finer, and more delicate Work is best fastned with *Fish Glew*, to be had of the *Drongist* by the name of *Ichthyocolla*; you may find how the best is made of the *Skin* of *Sturgeon*, in the *Philos. Transf. Vol. 11. Num. 129.* and here I conclude.

36. Let us now then sum up all the good *qualities*, and *transcendent* perfections of *Trees*, in the harmonious *Poets* Consort of *Elogies*.

—Pines are for Masts an useful Wood,
cedar and cypres, to build Houles good:
Hence covers for their cars, and spikes for Wheels
Swains make, and Ships do form their crooked Reels:
The Twiggy Sallows, Elms with leaves are freight;
Myrtles stout Spears, and Cornel good for fight:
The Yews into Hyean Bows are bent;
Smooth Limes, and Box, the Turners Instrument
Shaves into form, and hollow Cups does trim;
And down the rapid Rye light Alders swim:
In hollow Bark Bees do their hony live,
And make the Trunk of an old Oak their Hive.

—dant vitæ lignum
Nevigium Pinos, domibus Cedrologis Cypripisq;
Hinc rados priore vatis, hinc tympana plautis
Agriote, & pandas ratibus posuit carinas.
Viminibus Salices, sacuade frondibus Olmi:
At Myrtus validis hastilibus & bona bello
Cornus: Ixyos Taxi taquestant in arces.
Nec Tillæ lices, aut toro rasis Boxum,
Non formam accipiunt seroque cavantar auto:
Nec non torquent undam levis innatat Alnus
Missâ Pado, nec non & apes examina condant
Corticibusque cavus, vitæque lictis alveo:
Georg. 2.

and the most ingenious *Ovid*, where he introduces the miraculous *Groves* rais'd by the melodious *Song* of *Orpheus*,

—Nor Trees of Ebony,
The Poplar, various Oaks that pierce the sky,
Soft Linden, smooth-rind Birch, unmarried Bay,
The brittle Hazel, Ash, whose spears we pralle,
Unknotty Fir, the foliate shading Planes,
Rough Chestnuts, Maple Flick'd with different granes,
Stream-bordering Willow, Latex loving foralces,
Tuff Box, whom never fappy spring foralces,
The slender Tamarisk, with Trees that bear
A purple Fig, nor Myrtles absent were.
The wanton rose wreath'd in amorous vines,
Vines bearing Grapes, and Elms supporting Vines,
Straight Service-Trees, Trees dropping Pitch, fruit-red
Albans, these the rest accompanied.
With limber Palms, of Victory the prize:
And upright Pine, whose leaves like bristles rise,
Priz'd by the Mother of the Gods.—

Sandys.

—non Chaonis absist arbor,
Non nemus Heliadam, non frondibus Ascalus Altiis,
Nec Tillæ molles nec Fagus, & innuba Laurus,
Et coryli fragiles, & Praxinus nulli bellis
Eandem Albes, curvataque glandibus Ilex,
Et Platanus genialis, Acerque coloribus impar,
Ammilæque simul Salices, & aquatica Lotus,
Perpetuæque virens Boxus, tenuisque Myrica,
Et bicolor Myrtus, & bacis cernua Ficus.
Vos quoque flexi-pedes Hederæ vinctilis, & ana
Pampine Vites, & amilæ Vitisbus Olmi,
Orniquæ, & Vitis, Pomæque mœrata valenti
Arbutus, & lente viciatâ premia Palme,
Et succidua comas, hirsutæque vertice Pini
Grata Dæm matris, &c.—

Mt. 10.

as the incomparable *Poet* goes on, and is imitated by our divine *Spencer*, where he brings his gentle *Knights* into a shady *Grove*,
pailing

— the

— the *Trees* so straight, and high,
 The sailing *Pine*, the *Cedar* proud, and tall,
 The Vine-prop *Elm*, the *Poplar* never dry;
 The builder *Oak*, sole King of *Forests* all;
 The *Aspine*, good for Staves; the *Cypress* funeral:
 The *Laurel*, meed of mighty Conquerours
 And Poets sage; The *Fir* that weepeth still;
 The *Willow*, worn of forlorn Paramours;
 The *Engb*, obedient to the benders will;
 The *Birch* for Shafts; the *Sallow* for the Mill;
 The *Amyrbe* sweet bleeding in the bitter wound;
 The War-like *Beech*; the *Ash* for nothing ill;
 The fruitful *Olive*; and the *Plasane* round;
 The Carver *Holm*; the *Maple*, seldom inward found.

Canto. 1.

And in this *Symphony* might the noble *Tasso* bear likewise his part;
 but that these are sufficient, & *tria sunt omnia*.

37. For we have already spoken of that modern *Art* of *Tapping*
Trees in the *Spring*, by which doubtless some excellent and *speci-*
fic Medicines may be attained; as from the *Birch* for the *Stone*;
 from *Elms*, and *Elder* against *Feavers*; so from the *Vine*, the
Oak, and even the very *Bramble*, &c. besides the wholesome and
 pleasant *Drinks*, *Spirits*, &c. that may possibly be educed out
 of them all, which we leave to the *Industrious*, satisfying our
 selves, that we have been among the *first* who have *hinted*, and
Publis'd the *ways* of performing it.

What now remains concerns only some general *Precepts*, and
Directions applicable to most of that we have formerly touched;
 together with a *Brief* of what farther *Laws* have been enacted for
 the *Improvement*, and preservation of *Woods*; and which having
 dispatch'd, we shall with a short *Paraphrase* touching the present or-
 dering, and disposing of his *Majesties Plantations* for the future
 benefit of the *Nation*, put an end to this rustick Discourse.

C H A P.

C H A P. XXXII.

Aphorisms, or certain general Precepts of use
to the foregoing Chapters.

1. **T**R Y all sorts of *Seeds*, and by their *thriving* you shall best
 discern what are the most proper *kinds* for Grounds,

Quippe solo natura subest—

and of these design the main of your *Plantation*. Try all *Soils*, and
 fit the *Species* to their natures: *Beech*, *Hazel*, *Holly*, &c. affect
 Gravel and gritty; and if mix'd with loam, *Oak*, *Ash*, *Elm*, &c.
 In stiff ground the *Ash*, *Horn-beam*, &c. and in a light feeding
 ground or loam, any sort whatsoever: In the lower, and wetter
 lands, the *Aquatics*, &c.

2. Keep your newly sown *seeds* continually fresh, and in the *shade*
 (as much as may be) till they peep.

3. All *curious* *Seeds*, and *Plants* are diligently to be *weeded*, till
 they are strong enough to over-drop or suppress them: And you
 shall carefully *haw*, *half dig*, and stir up the earth about their *Roots*
 during the first *three* years; especially, in the *Vernal*, and *Autum-*
nal Equinoxes: This work to be done in a *moist* season for the
 first year, to prevent the *dust*, and the suffocating of the tender
buds; but afterwards, in the more dry weather.

4. *Plants*, rais'd from *seed*, shall be *thinn'd* where they come up
 too *thick*; and none so fit as you thus draw, to be *transplanted* in-
 to *Hedge-rows*, especially, where ground is precious.

5. In *transplanting*, omit not the placing of your *Trees* towards
 their accusom'd *Aspect*. And if you have leisure, make the *holes*
 the *Autumn* before, the wider the better, three foot over, and two
 deep is little enough if the *Ground* be any thing *stiff*; often stir-
 ring, and turning the *mould*, and mixing it with *better* as you may
 find cause: This done, dig, or *plough* about them, and that as
 near their *stems* as you can come, without hurting them, and there-
 fore rather use the *spade* for the first two or three years; and
 preserve what you plant *steady* from the *Winds*, and annoyance
 of *Cattel*, &c.

6. Remove the *softest* wood to the *moistest* grounds, as in *Num. 1.*

Divise arboribus partie—

7. Begin to *Transplant* *Forest-trees* when the *leaves fall* after
Michaelmas; you may adventure when they are *turnish'd*, and
 grow yellow: It is lost time to commence later, and for the most
 part of your *Trees*, early *Transplanters* seldom repent; for some-
 times

times a tedious bind of *Frost* prevents the whole *season*, and the baldness of the *Tree* is a note of deceit; for some *Oaks*, *Horn-beams*, and most *Beeches*, preserve their *dead leaves* till *new* ones pull them off.

8. Set deeper in the *lighter grounds* than in the *strong*; but shallowest in *Clay*: five inches is sufficient for the *dryest*, and one or two for the *moist*, provided you establish them against *winds*.

9. Plant forth in *warm*, and *moist* seasons; the *Air* tranquil and serene; the *wind* westerly; but never whiles it actually *freezes*, *rains*, or in *Misty Weather*; for it moulds, and infects the *Roots*.

10. What you gather, and draw out of *Woods*, plant immediately, for their *Roots* are very apt to be mortified or harden'd and wither'd by the *winds*, and cold air.

11. *Trees*, produc'd from *Seeds* must have the *Tap-roots* abated (the *Walnut-tree*, and some others excepted, and yet if Planted merely for the *Fruit*, some affirm it may be adventur'd on with success) and the bruised parts cut away; but sparing the *fibrous*, for they are the principal *seeders*; and those who cleanse them too much, are punish'd for the mistake.

12. In *spring*, rub off some of the *Collateral Buds*, to check the exuberancy of *Sap* in the *branches*, till the *Roots* be well establish'd.

13. *Transplant* no more than you well *Fence*; for that neglected, *Tree-culture* comes to nothing: Therefore all young set *Trees* should be defended from the *winds*, and *Sun*; especially the *East*, and *North*, till their *Roots* are fixed; that is, till you perceive them *shoot*; and the not exactly observing of this *Article*, is cause of the perishing of the most tender *Plantations*; for it is the invasion of these two *assailants* which does more mischief to our new set, and less hardy *Trees*, than the most severe and durable *Frosts* of a whole *Winter*.

14. The properest *soil*, and most natural, apply to distinct *species*, *Nec vero terra ferre omnes omnia possunt*. Yet we find by experience, that most of our *Forest-Trees* grow well enough in the *conquest* Lands; provided there be a competent depth of *mould*: For albeit most of our *wild Plants* covet to run just under the *surface*; yet where there is not sufficient depth to *cool* them, and entertain the *Moisture* and *Influences*, they are neither lasting, nor prosperous.

15. *Wood* well Planted, will grow in *Moorish*, *Boggy*, *Heathy*, and the *stoniest* grounds: Only the white, and blew *clay* (which is commonly the best *Pasture*) is the worst for *wood*; and such good *Timber* as we find in any of these (*Oaks* excepted) is of an excellent age, requiring thrice the time to arrive at their stature.

16. If the *season* require it, all new *Plantations* are to be pled with *waterings*, which is better pour'd into a *circle* at some distance from the *Roots*, which should continually be *bared* of *Grass*, and if the *water* be *rich*, or *impregnated*, the *shoots* will soon discover it; for the *Liquor* being *percolated* through a quantity of *earth*,
will

will carry the *nitrous* virtue of the *soil* with it; by no means therefore *water* at the *stem*; because it washes the *mould* from the *Root*, comes too crude, and endangers their *rotting*: But,

17. For the cooling and refreshing *Tree-roots*, the congeling of rotten *litter* sprinkl'd over with fine *earth*, or place *Pot-sheards*, *Flints*, or *Pibbles* near the foot of the *stem*, for so the *Poet*,

Lime-stones, or squalid Shells, that may the Rain,
Vapours, and gliding moisture entertain.

Aut lapidem bibulum, aut squallentis infosce conchas,
Inter enim labantur aquae, tenuisque subibit
Halius.

Georg. 2.

But remember you *remove* them after a competent time, else the *Vermine*, *Snails*, and *Insects* which they produce and shelter, will gnaw, and greatly injure their *Bark*, and therefore to lay a *Coat* of moist rotten *litter* with a little *Earth* upon it, will preserve it moist in *Summer*, and warm in *Winter*, enriching the *showrs* and *dews* that strain through it.

18. Young *Plants* will be strangled with *Corn*, *Oats*, *Pease*, or *Hemp*, or any rankly growing *Grain*, if a competent *circle*, and distance be not left (as of near a *yard*, or so) of the *stem*; this is a *useful* remark.

19. Cut no *Trees* (especially, having an eminent *Pith* in them; being young and tender too) when either *beat*, or *cold* are in *extremes*; nor in very *wet*, or *snowy* weather; and in this work it is profitable to discharge all *Trees* of unthriving, broken, wind-shaken *browse*, and such as our *Law* terms *Cablicia*; and to take them off to the quick;

—ne pars sincera trahatur.

And for *Ever-greens*, especially such as are tender, prune them not after Planting, till they do *Radicate*, that is, by some little fresh *shoot*, discover that they have taken.

20. Cut not off the top of the *leading-twigs* or *shoot* (unless very crooked, and then at the next erect *bud*) when you *transplant* *Timber* trees, but those of the *Collateral* you may shorten, stripping up the rest close to the *stem*; and such as you do spare, let them not be the most *opposite*, but rather one above another to preserve the part from swelling, and hindring its taper growth: Be careful also to keep your *Trees* from being over *top-heavy*, by shortning the side branches competently near the *stem*: Young plants nipt either by the *Frost* or teeth of *Cattle* do commonly break on the sides, which impedes both growth and spiring: In this case, prune off some, and quicken the *leading-shoot* with your knife, at some distance beneath its infirmity: But if it be in a very unlikely condition at *spring* cut off *all* close to the very ground, and hope for a new *shoot*; continually suppressing whatever else may accompany it, by cutting them away in *Summer*.

21. *Walnut*, *Ash*, and *Pithy-trees* are safer pruned in *Summer* and warm weather, than in the *spring*, whatever the vulgar fancy. And so

I will conclude with the *Technical* names, or *diffimilar* parts of *Trees*, as I find them enumerated by the *Industrious* and *Learned* Dr. Merett. *Scapus, Truncus, Cortex, Liber, Malicorium, Matrix, Medulla & Cor, Pecten, Circuli, Surculi, Rami, Sarmenta, Ramusculi, Spadix, Vimen, Virgultum & Creminum, Vitilia, Talea, Scobs, Termer, Turiones, Frondes, Cachryas & Nucamentum, Julius & Catulus, Comæ*: The Species *Frutex, Suffrutex, &c.* all which I leave to be put into good and proper *English*, by those who shall once oblige our *Nation* with a full, and absolutely complete *Dictionary*, as yet a *desiderate* amongst us.

To this I shall add, the *Time*, and *Season* of the *flourishing* of *Trees*, computing from the *entree* of each *Month* as the *figures* denote; that is, from *March* (where the *Doctor* begins) inclusively. *March, Apr* 3. (i.) from *March* to *May*, viz. one *Month*; & sic de cæteris. *Populus* 2. *Quercus* 5. *Sorbus* 2. *Ulmus* 2. *April*, *Alnus* 2. *Betula* 2. *Castanea* 4. *Euonymus* 2. *Fagus* 2. *Fraxinus* 2. *Nux-juglans* 3. *Salix* 2. *Sambucus* 2. *May*, *Cornus* 2. *Geniſſa* 4. *Juniperus, Morus* 2. *Tilia* 4. *June*, *Aquifolium* 2. *July*, *Arbutus* 2. *Feb.* *Buxus* 2.

Many more useful *Observations* are to be collected, and added to these, from the diligent experience of *Planters*.

CHAP. XXXIII.

Of the Laws and Statutes for the Preservation, and Improvement of Woods, &c.

1. **T**IS not to be passed by, that the very first *Law* we find which was ever promulg'd, was concerning *Trees*; and that *Laws* themselves were first *Written* upon them, or *Tables* compos'd of them; and after that *Establishment* in *Paradise*, the next we meet withal areas *Antient* as *Moses*; you may find the *Statute* at large in *Deut* c. 20. v. 19, 20. Which though they chiefly tended to *Fruit-trees*, even in an *Enemies* Countrey, yet you will find a case of necessity, only alledg'd for the permission to destroy any other.

2. To Summe up briefly the *Laws*, and *Civil Constitutions* of great *Antiquity*, by which *Servius* informs us 'twas no less than *Capital, alienas arbores incidere*; the *Lex Aquilia*, and those of the xii. *Tabb.* mention'd by *Paulus, Cajus, Julianus*, and others of that *Robe*, repeated divers more.

It was by those *Sacred Constitutions* provided, that none might so much as *Plant Trees* on the *Confin*es of his *Neighbours* *Ground*, but he was to leave a *space* of at the least *five foot*, for the smallest *Tree*, that they might not injure him with their shadow. *Si Arbor*

in

in *Vicini agrum impenderit, eam subucato, &c.* and if for all this, any hung over farther, 'twas to be *Strip'd* up *fifteen foot*; And this *Law Baldwinus, Olderdorpianus*, and *Hotoman* recites out of *Ulpian* L. 1. F. de Arb. *Cedend.* where we have the *Prætoris Interdict* express'd, and the impendent *Wood* adjudged to appertain to him whose *field*, or *fence* was thereby *damnnified*: Nay, the *Wife* *Solon* prescribed *Ordinances* for the very *distances* of *Trees*; as the *divine Plato* did against *stealing* of *fruit*, and *violating* of *Plantations*: And the *interdiction* de *Glande legenda* runs thus in *Ulpian*, *AIT PRÆTOR, GLANDEM, QUÆ EX ILLIUS AGRO IN TVVM CADIT, QUO MINVS ILLI TERTIO QUOQUE DIE LEGERE AVFERRE LICEAT, VIM FIERI VETO.* And yet, though by the *Prætoris* permission he might come every *third* day to gather it up without *Trespas*, his *Neighbour* was to share of the *Mast* which so fell into his *Ground*; and this *Chapter* is well supplied by *Pliny* l. 16. c. 5. and *Cajus* upon the *Place*, interprets *Glandem* to signifie not the *Acorns* of the *Oak* alone, but all sorts of *fruit* whatsoever, l. 136. F. de Verb. signif. L. *Unus ff. de Glande leg.* as by usage of the *Greeks*, amongst whom ἀκχεῖν imports all kind of *Trees*.

Moreover, no *Trees* might be *Planted* near *Publique Aquæ-duës*, lest the *Roots* should insinuate into, and displace the *Stones*: Nor on the very *margent* of *Navigable Rivers*, lest the *Boats* and other *Vessels* passing to and fro, should be *hindred*, and therefore such impediments were call'd *Rete*, quia *Naves retinent*, says the *Gloss*; and because the falling of the *leaves* corrupted the *Water*. So nor within such a distance of *High-ways* (which also our own *Laws* prohibit) that they might *dry* the better, and less cumber the *Traveller*. *Trees* that obstructed the *Foundation* of *Houses* were to be fell'd; *Barthol.* L. 1. doct. c. de *Interdict. Vlp.* in L. *priore ff. de Arborum cedend.* *Trees* spreading their *Roots* in *neighbour-ground*, to be in *common*; See *Cujas* and *Paulus* in L. Arb. ff. de *Communi dividend.* where more of the *Alienation* of *Trees* fell'd, and not standing but with the *Funds*, as also of the *Usu-fruit* of *Trees*, and the difference 'twixt *Arbores Grandes*, and *Creminales* or *Cedue*, of all which *Ulpian, Baldus, Alciat*, with the *Laws* to govern the *Conducatores* and *Subducatores*, and *Pruners*; vide *Pan. f. c. Sent. l. 5. Festus, &c.* for we pass over what concerns *Vines* and *Olive-trees*, to be found in *Cato* de R. R. &c. Nor is it here that we design to enlarge, as those who have *philologiz'd* on this occasion de *Sycophantia*, and other curious *criticisms*; but to pass now on, and confine my self to the prudent *Sanctions* of our own *Parliaments*: for though according to the old and best *Spirit* of true *English*, we ought to be more powerfully led by his *Majesties* Example, than to have need of more cogent and violent *Laws*; yet that our *Discourse* may be as ample, and as little defective as we can render it, something 'tis fit should be spoken concerning such *Laws* and *Ordinances* as have been from time to time constituted amongst us for the *Encouragement*, and *Direction* of such as do well, and for the *Animadversion* and *Punishment* of those

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those who continue *refractory*, which I deduce in this *order*.

3. From the time of *Edward the fourth*, were enacted many excellent *Laws* for the *Planting*, *securing*, *cutting*, and *ordering* of *Woods*, *Coppices*, and *Under-woods*; as then they took cognizance of them; together with the several *penalties* upon the *Infringers*; especially from the 25 of *Hen. 8. 17. &c.* confirm'd by the 13 and 27. of *Q. Eliz. cap. 25. 19. &c.* which are diligently to be consulted, revived, put in execution, and enlarg'd where any defect is apparent; as in particular the *Act* of exempting of *Timber* of 22 years growth from *Tythe*, for a longer period, to render it compleat, and more effectual to their *Improvement*: And that *Law* repealed, by which *Willows*, *Sallows*, *Oziers*, &c. which they term *Sub-bois*, are reputed but as *Weeds*.

4. Severer *punishments* have lately been ordain'd against our *Wood-sealers*, destroyers of young *Trees*, &c. By an antient *Law* of some *Nation*, I read he forfeited his *Hand*, who beheaded a *Tree* without permission of the *Owner*; and I cannot say they are sharp ones, when I compare the severity of our *Laws* against *Mare-sealers*; nor am I by inclination the least *cruel*; but I do affirm, we might as well live without *Mares*, as without *Masts* and *Ships*, which are our *wooden*, but no less profitable *Horses*.

5. And here we cannot but perfringe those *Ryotous Assemblies* of *Idle People*, who under pretence of going a *Maying* (as they term it) do oftentimes cut down and carry away fine straight *Trees*, to set up before some *Ale-house*, or *Reveling-place*, where they keep their drunken *Bacchanalias*: For though this *Custom* was, I read, introduc'd by the *Emperor Anastasius*, to abolish the *Gentile Majana* of the *Romans* at *Ostia*; which was to transfer a great *Oaken-Tree* out of some *Forest* into the *Town*, and erect it before their *Mistress's Door*; yet I think it were better to be quite abolish'd amongst us, for many *reasons*, besides that of occasioning so much *waste* and *spoil* as we find is done to *Trees* at that *Season*, under this wanton pretence, by *breaking*, *mangling*, and *tearing* down of *branches*, and intire *Arms* of *Trees*, to adorn their *Wooden-Idol*. The *Imperial Law* against such disorders we have in *L. ob. id. si ad legem Aquill. & in ff. l. 47. Tit. 7. Arborem furtim casurum*: See also *Triphon L. ig. de Bon. off. cont. tab. vel in ligna focaria. L. Ligni ff. de Lige 3 &c.*

To these I might add the *Laws* of our King *Ina*; or as the Learned *Lambert* calls them, *Αρχαιοποια de prisca Anglorum legibus*, whose Title is, *Be papa bapnece*: of *Burning Trees*: The *Sanction* runs thus.

If any one set fire of a fell'd Wood, he shall be punished, and besides pay three pounds, and for those who clandestinely cut Wood (of which the very sound of the Axe shall be sufficient Conviction) for every Tree he shall be mulcted thirty shillings. A Tree so fell'd under whose shadow thirty Hogs can stand, shall be mulcted at three pounds, &c.

6. I have heard, that in the great *Expedition* of 88, it was expressly enjoin'd the *Spanish* Commanders of that signal *Armada*; that

that if when landed they should not be able to subdue our *Nation*, and make good their *Conquest*; they should yet be sure not to leave a *Tree* standing in the *Forest of Dean*: It was like the *Policy* of the *Philistines*, when the poor *Israelites* went down to their *Enemies Smiths* to sharpen every man his *Tools*; for as they said, *lest the Hebrews make them Swords, or Spears*; so these, *lest the English build them Ships, and Men of War*: Whether this were so, or not; certain it is, we cannot be too *jealous* for the preservation of our *Woods*; and especially of those eminent, and, with *care*, inexhaustible *Magazines*: I dare not suggest the encouragement of a yet farther *restraints*, that even *Proprietors* themselves should not presume to make havock of some of their own *Woods*, to feed their *prodigality*, and heap *fuel* to their *vices*; but it is worthy of our observation, that (in that inimitable *Oration*, the second *Philippic*) *Cicero* does not so sharply reproach his great *Antagonist* for any other of his *Extravagancies* (which yet he there enumerates) as for his *wasteful* disposal of certain *Wood-lands*, belonging to the *Common-wealth*, amongst his jovial *Bravo's*, and lewd Companions; *tua ista detrimenta sunt* (meaning his *Debauches*) *illa nostra*; speaking of the *Timber*: and doubtless, the spoil, and wasting of this necessary *material* is no less than a public calamity; this, *John Duke of Lancaster* knew well enough, when to revenge the depredations made upon the *English* borders, 'tis said, he set four and twenty thousand *Axes* at work at once, to destroy the *Woods* in *Scotland*.

7. But to the *Laws*: it were to be wish'd that our tender, and improvable *Woods*, should not admit of *Cattle*, by any means, till they were quite grown out of *reach*; the *Statutes* which connive at it, in favour of *Custom*, and for the satisfying of a few clamorous and rude *Commoners*, being too *indulgent*; since it is very evident, that less than a 14. or 15. years *enclosure* is, in most places, too soon; and our most *material* *Trees* would be of *infinite* more worth and improvement, were the *Standards* suffer'd to grow to *Timber*, and not so frequently cut, at the next *selling* of the *Wood*, as the general custom is. In 22 *Edw. 4.* the liberty arriv'd but to seven years after a *selling* of a *Forest* or *Purlieu*; and but three years before, without special licence: This was very narrow; but let us then look on *England* as an over-grown Country.

8. *Wood* in *Parks* was afterwards to be four years Fenced, upon *selling*: and yearling *Colts*, and *Calves* might be put into inclosed *Woods* after two: By the 13 *Eliz.* five years, and no other *Cattle* till six, if the growth was under fourteen years; or until eight, if exceeding that age till the last *selling*: All which *Statutes* being by the *Act* of *Hen 8* but *temporal*, this *Parliament* of *Eliz.* thought fit to make *perpetual*.

9. Then, to prevent the destructive *razing*, and converting of *Woods* to *Pasture*: No wood of two *Aces*, and above two *furlongs* from the *Mansion House*, should be indulg'd: And the *prohibitions* are good against *Assarts* made in *forests*, &c. without licence: The *Penalties* are indeed great; but how seldom inflicted? and what

what is now more easie, than Compounding for such a licence?

In some parts of *Germany*, where a single *Tree* is observ'd to be extraordinary fertile, a constant, and plentiful *Mast-beaver*; there are *Laws* to prohibit their *selling* without special leave: And it was well *Enacted* amongst us, that even the *Owners* of woods within *Chases*, should not cut down the *Timber* without view of *Officers*; this *Act* being in *affirmance* of the *Common Law*, and not to be violated without *Prescription*: See the *Case* cited by my Lord *Cook* in his *Comment on Littleton. Tenure Burgage. L. 2. Sect. 170.* Or if not within *Chases*, yet where a *Common-person* had liberty of *Chase*, &c. and this would be of much benefit, had the *Regarders* perform'd their duty, as 'tis at large described in the *Brit* of the 12 *Articles*; and that the *Surcharge* of the *Forests* had been honestly inspected with the due *Perambulations*, and ancient *Meters*: Thus should the *Justices* of *Eire* dispose of no Woods without express *Commission*, and in convenient places: *Minuti blaterones quercuum, culi, & curbi*, as our *Law* terms *wind-falls, dotterels, scrags, &c.* and no others.

10. Care is likewise by our *Laws* to be taken that no unnecessary *Imbzilment* be made by pretences of Repair of *Paling, Lodges, Brows* for *Deer, &c. Wind-falls, Root-falls*; dead, and *Sear-trees*, all which is subject to the Inspection of the *Warders, Justices, &c.* and even trespasses done *de Viridi* on boughs of *Trees, Thickets*, and the like; which (as has been shew'd) are very great impediments to their growth and prosperity, and should be duly looked after, and punish'd; and the great neglect of *Swainmote-Courts* reformed, &c. See *Consuet. & Assis. Forest. Pannagium, or Pastura pecorum & de Glandibus, Fleta, &c. Manwoods Forest-laws: Cook pla. fol. 366. li. 8. fol. 128.*

11. Finally, that the exorbitance, and increase of devouring *Iron-mills* were looked into, as to their *distance*, and *number* near the *Seas*, or *Navigable Rivers*; And what if some of them were even remov'd into another world? 'twere better to purchase all our *Iron* out of *America*, than thus to exhaust our woods at home, although (I doubt not) they might be so order'd, as to be rather a means of conserving them. There was a *Statute* made by *Queen Eliz.* to prohibit the converting of *Timber-trees* to *Coal*, or other *Fuel* for the use of *Iron-mills*; if the *Tree* were of one foot square, and growing within fourteen Miles of the *Sea*, or the greater *Rivers, &c.* 'tis pity some of those places in *Kent, Sussex, and Surrey* were excepted in the *Proviso*, for the reason express'd in a *Statute* made 23 *Eliz.* by which even the employing of any *under-wood*, as well as *great Trees*, was prohibited within 22 miles of *London*, and many other *Navigable Rivers, Creeks*, and other lesser distances from some parts of *Sussex-Downs, Cinque-Ports, Havens, &c.*

There are several *Acres* of *Wood-land* of no mean circuit near *Rocheſter*, in the County of *Kent*, extending as far as *Bexley*, and indeed, for many miles about *Shoters-Hill*, near the *River of Thames*, which, were his *Majesty* owner of, might in few years be

be of an *un-valuable Improvement* and benefit, considering how apt they are to grow *Forest*, and how opportune they lye for the use of his *Royal Navy* at *Chatham*.

12. But yet to prove what it is to manage Woods discreetly; I read of one Mr. *Christopher Darell* a *Surrey* Gentleman of *Nudi-gate*, that had a particular *Indulgence* for the cutting of his Woods at pleasure, though a great *Iron-Master*; because he so order'd his *Works*, that they were a means of preserving even his Woods; notwithstanding those insatiable devourers: This may appear a *Paradox*, but is to be made out; and I have heard my own *Father* (whose *Estate* was none of the least wooded in *England*) affirm, that a *Forge*, and some other *Mills*, to which he furnish'd much *fuel*, were a means of maintaining, and improving his Woods; I suppose, by increasing the *Industry* of *Planting*, and care; as what he has now left standing of his own *Planting, enclosing, and cherishing*, in the possession of my most honoured Brother *George Evelyn* of *Wotton* in the same County, does sufficiently evince; a most laudable Monument of his *Industry*, and rare Example, for without such an Example, and such an Application, I am no Advocate for *Iron-works*, but a declared denouncer: But *Nature* has thought fit to produce this *wasting-Oare* more plentifully in *Wood-land*, than any other *Ground*, and to enrich our *Forests* to their own Destruction,

O Poverty, still safe! and therefore found
Indeſcribably with *Mischiefs* under ground!
Woods tall, and Reverend from all time appear
Indivisible, where no *Mine* is near.

O ſemper bona pauperes! & conditus alia
Theſaurus culture nocens! O ſemper vorantes,
Intigres, ſilvæque ſolo non devoræ Sylva!

Coulſei Pl. l. 6.

for so our sweet *Poet* deploras the Fate of the *Forest* of *Dean*.

13. The same *Act* we have Confirmed, and enlarged in the Seventeenth of the said *Queen*, for the preserving of *Timber-Trees*, and the Penalties of impairing Woods much increased; the *Tops* and *offals* only permitted to be made use of for this employment.

14. As to the Law of *Tythes*, I find *Timber-Trees* pay none, but others do, both for *Body, Branches, Bark, Fruit, Root*, and even the *Suckers* growing out of them; and the Tenth of the *Body* sold, or kept: And so of *Willows, Sallows*, and all other *Trees* not apt for *Timber*: Also of *Sylva cadua*, as *Coppes*, and *Under-woods*, pay the tenth when ever the *Proprietor* receives his nine Parts. But if any of these we have named un-exempted are cut only for *Mounds, Fencing, or Plow-boot* within the Parish in which they grow, or for the Fuel of the *Owner*, no *Tythes* are due, though the *Vicar* have the *Tyth-wood*, and the *Parson* that of the places so inclosed; nor are *Under-woods* grub'd up by the *Roots Tythable*, unless for this, and any of the former cases there be *Prescription*. But for *Timber-trees*, such as *Oak, Alb, Elm* (which are accounted *Timber* in all places after the first twenty years) also *Beech, Horn-beam, Maple, Aſpen*, and even *Hazel* (many of which are in some Countries reputed *Timber*) they are not to pay *Tythes*, unless they are fell'd before the said age of twenty years from their first *Planting*. Note here,

If

If the Owner fell a fruit-tree (of which the Parson has had *tythe* that year) and convert the wood into fuel, the *tythe* shall cease; because he cannot receive the *tythe* of one thing twice in one year.

Beech, in Countrys where it abounds, is not *tythable*; because in such places 'tis not accounted *Timber*. 16 Jac. Co. E. Pinders Case.

Cherry-trees in Buckinghamshire have been adjudged *Timber*, and *Tythe-free*. Pasch. 17 Jac. B. R.

If a Tree be lop'd under twenty years growth, and afterwards be permitted to grow past twenty years, and then be lop'd again, no *tythe* is due for it, though at the first cutting it were not so.

If wood be cut for *hedges*, which is not *tythable*, and any be left of it unemploy'd, no *tythe* shall be paid for it.

If wood be cut for *Hop-poles* (where the Parson or Vicar has *tythe* Hops) in this case he shall not have *tythe* of *Hop-poles*.

If a great wood consist chiefly of *Under-wood Tythable*, and some great trees of *Beech*, or the like grow dispersedly amongst them; *Tythe* is due, unless the *Custom* be otherwise, of all both great and lesser together: And in like manner if a wood consist for the most part of *Timber trees*, with some small scatterings of *Under-wood* amongst them, no *Tythe* shall be paid for the *Under-wood* or *Bushes*. Trin. 19 Jac. B. R. Adjudg. 16 Jac. in C. B. Leonards case.

No *Tythe* is to be paid of Common of *Estovers*, or the wood burnt in ones *Houfe*. Now as to the manner of Payment:

To give the Parson the Tenth Acre of Wood in a Copp'ce, or the tenth Cord (provided they are equal) is a good payment, and setting forth of *Tythes*, especially if the *Custom* confirm it.

The *Tythe* of Mast of Oak, or *Beech*, if sold, must be answer'd by the tenth Penny: if eaten by *Swine*, the worth of it. And thus much we thought fit to add concerning *Predial Tythes*; who has desire to be farther inform'd may consult my Lord Cook's Rep. 11. 48, 49, 81. Flow. 470. Brownlows Rep. 1 part 94. 2 part 150. D. and St. 169. &c. But let us see what others do.

15. The King of Spain has near Bilbao, sixteen times as many Acres of Copp'ce wood as are fit to be cut for Coal in one year; so that when 'tis ready to be sell'd, an Officer first marks such as are like to prove *Ship-timber*, which are let stand, as so many *sacred*, and dedicate Trees: But by this means the *Iron-works* are plentifully supplied in the same place, without at all diminishing the stock of *Timber*. Then in Biscay again, every Proprietor, and other, Plants three for one which he cuts down; and the Law obliging them is most severely executed. There indeed are few, or no Copp'ces; but all are Pollards; and the very lopping (I am assur'd) does furnish the *Iron-works* with sufficient to support them.

16. What the practice is for the maintaining of these kind of Plantations in Germany, and France, has already been observ'd to this Illustrious Society by the Learned Dr. Merret; viz. that the Lords and (for the Crown-lands) the Kings Commissioners, divide the Woods, and Forests, into eighty partitions; every year felling one

one of the divisions; so as no wood is sell'd in less than four score years: And when any one partition is to be cut down, the Officer, or Lord contracts with the Buyer that he shall at the distance of every twenty foot (which is somewhat near) leave a good, fair, sound and fruitful Oak standing. Those of twixt forty, and fifty years they reckon for the best, and then they are to fence these Trees from all sorts of Beasts, and injuries, for a competent time; which being done, at the season, down fall the Acorns, which (with the Autumnal rains beaten into the earth) take root, and in a short time furnish all the Wood again, where they let them grow for four, or five years; and then grub up some of them for Fuel, or Transplantations, and leave the most probable of them, to continue for Timber.

17. The French King permits none of his Oak woods, though belonging (some of them) to Monsieur (his Royal Brother) in Appenage, to be cut down; till his own Surveyers, and Officers, have first marked them out; nor are any sell'd beyond such a Circuit: Then are they sufficiently fence'd by him who buys; and no Cattel whatsoever suffer'd to be put in, till the very seedlings (which spring up of the Acorns) are perfectly out of danger. But these, and many other whollom Ordinances, especially, as they concern the Forest of Dean, we have comprised in the late Statute of the Twentieth of his Majesties Reign, which I find Enacted five years after the first Edition of this Treatise: And these Laws are worthy our perusal; as also the Statute prescribing a Scheme of Proportions for the several scantlings of Building Timber (besides what we have already touch'd Chap. 31. Sect. 26. &c.) which you have 19 Car. 2. intituled, An Act for the Re-building of London; to which I refer the Reader.

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C H A P. XXXIV.

The Parænesis and Conclusion, containing some Encouragements and Proposals, for the Planting, and Improvement of his Majesties Forests, and other Amœnities for Shade, and Ornament.

1. Since our *Forests* are undoubtedly the greatest *Magazines* of the *Wealth*, and *Glory* of this *Nation*; and our *Oaks* the truest *Oracles* of its *perpetuity* and *happiness*, as being the only support of that *Navigation* which makes us fear'd abroad, and flourish at *Home*; it has been strangely wonder'd at by some good *Patriots*, how it comes to pass that many *Gentlemen* have frequently repair'd, or gain'd a sudden *Fortune*, with *Plowing* part of their *Parks*, and setting out their fat grounds to *Gardners*, &c. and very wild wood-land parcels (as may be instanc'd in several places) to *dressers of Hop-yards*, &c. whiles the *Royal portion* lies folded up in a *Napkin*, uncultivated, and neglected? especially, those great, and ample *Forests*; where, though *plowing*, and *sowing* has been forbidden, a *Royal Command*, and *Edict*, may well dispense with it, and the breaking up of those *Intervals*; advance the growth of the *Trees* to an incredible *Improvement*.

2. It is therefore insisted on, that there is not a cheaper, easier, or more prompt *expedient* to advance *Ship-timber*, than to solicit, that in all his *Majesties Forests*, *Woods*, and *Parks*, the spreading *Oak*, &c. (which we have formerly describ'd) be cherish'd, by *Plowing*, and *sowing Barley*, *Rye*, &c. (with due supply of *culture* and *soyl*, between them) as far as may (without danger of the *Plow-share*) be broken up. But this is only where *these Trees* are arriv'd to some magnitude, and stand at competent distances; a *hundred*, or *fifty yards* (for their *Roots* derive relief far beyond the reach of any *boughs*) as do the *Walnut-trees* in *Burgundy*, which stand in their best *Plow'd lands*.

3. But, that we may particularize in his *Majesties Forests* of *Dean*, *Sherwood*, &c. and in some sort gratifie the *Queries* of the Honourable, the principal *Officers* and *Commissioners* of the *Navy*; I am advis'd by such as are every way *judicious*, and of long *experience* in those parts; that to *enclose* would be an excellent way: But it is to be consider'd, that the *People*, viz. *Foresters*, and *Bordurers*, are not generally so *civil*, and reasonable, as might be wish'd; and therefore to design a solid *Improvement* in such places, his *Majesty* must assert his *Power*, with a firm and high *Resolution* to reduce these men to their due *Obedience*, and to a necessity of sub-

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mitting to their own, and the publick utility; though they preserv'd their *industry* this way, at a very tolerable rate upon that condition, whiles some person of *trust*, and integrity, did regulate, and supervise the *Mounds* and *fences*, and destine some portions frequently set apart, for the raising, and propagating of *Woods*, till the whole *Nation* were furnish'd for *posterity*.

4. And which Work if his *Majesty* shall resolve to accomplish, he will leave such an everlasting *Obligation* on his *People*, and raise such a *Monument* to his *name*, as the *Ages* for a *thousand years* to come, shall have cause to celebrate his precious *Memory*, and his *Royal Successors* to emulate his *Virtue*. For thus (besides the future expectations) it would in *present*, be no deduction from his *Majesties Treasure*, but some increase; and fall in time to be a fair and worthy *Accession* to it; whiles this kind of *propriety* would be the most likely expedient to *civilize* those wild and poor *Bordurers*; and to secure the vast and spreading heart of the *Forest*, which with all this *Indulgence*, would be ample enough for a Princely *Demeasnes*: And if the difficulty be to find out who *knows*, or *acknowledges* what are the *Bordures*; this *Article* were worthy, and becoming of as serious an *Inquisition*, as the *Legislative Power* of the whole *Nation* can contrive.

5. The Sum of all, is; get the *Bordures* well *Tenanted*, by long *Terms*, and *easy Rents*, and this will invite and encourage *Takers*; whilst the *middle*, most secure, and interior parts would be a *Royal portion*. Let his *Majesty* therefore admit of any willing *Adventurers* in this vast *Circle* for such *Enclosures* in the *Prescinds*; and rather of *more*, than of *few*, though an *hundred* or *two* should joyn together for any *Enclosure* of *five hundred Acres* more, or less; that *multitudes* being thus engaged, the consideration might procure, and facilitate a full *discovery* of latter *Encroachments*, and fortifie the recovery by favourable *Rents*, *Improvements*, and *Reversions* by *Copy-hold*, or what other *Tenures* and *Services* his *Majesty* shall please to accept of.

6. Now for the *Planting of Woods* in such places (which is the main *Design* of this whole *Treatise*) the *Hills*, and *rough Grounds* will do well; but they are the rich fat *Vales*, and *flats* which do best deserve the charge of *walls*; such as that *Spot* affords; and the *Haw-thorn* well plant'd (single or double) is a better, and more natural *fence*, than *umorterd walls*, could our *industry* arrive to the making of such as we have describ'd: Besides, they are lasting, and profitable; and then one might allow sufficient *Bordure* for a *Mound* of any thickness, which may be the first charge, and well supported, and rewarded by the culture of the Land thus *enclosed*.

7. For Example, suppose a man would take in *500 Acres* of good Land, let the *Mounds* be of the wildest ground, as fittest for *woods*: Two *hedges* with their *Vallations*, and *Trenches* will be requisite in all the Round; viz. one next to the *Enclosure*, the other about the *Thicket* to fence it from *Cattle*: This, between the two *hedges* (of whatsoever breadth) is fittest for *Plantation*: In these *Hedges* might

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might be tryed the Plantation of *Stocks*, in the *intervals* all manner of *wood-seeds* sown (after competent *Plowings*) as *Acorns*, *Mast*, *Fir*, *Pine*, *Nuts*, &c. the first year chafing away the *Birds*, because of the *Fir* and *Pine* Seeds, for reasons given: the second year loofning the ground, and thinning the supernumeraries, &c. this is the most frugal way: Or by another *Method*, the *waste* places of *Forests* and *Woods* (which by through experience is known and tried) might be perfectly cleaned; and then allowing two or three *Plowings*, well rooted *Stocks* be set, cut and trimm'd as is requisite; and that the *Timber-trees* may be excellent, those afterwards *Coppiced*, and the choicest *Stocks* kept threaded. If an *Enclosure* be sow'd, the *Seeds* may be (as was directed) of all the *species*, not forgetting the best *Pines*, *Fir*, &c. While the yearly removal of very incumbrances only, will repay the *Workmen*, who fell the *Quick*, or reserve it to store other *Enclosures*, and soften the circumjacent grounds, to the very great improvement of what remains.

8. And how if in such *fencing-works*, we did sometimes imitate what *Quintus Curtius*, lib. 6. has Recorded of the *Mardorun gens*, near to the Confines of *Hyrcania*, who did by the close Planting of *Trees* alone upon the *Bordures*, give so strange a check to the Power of that great Conqueror *Alexander*? They were a barbarous People indeed, but in this worthy our imitation; and the Work so handsomely, and particularly describ'd, that I shall not grieve to recite it. *Arbores dense sunt de industria confite, quarum teneros adhuc ramos manu secunt, quos intortos rursus inferunt terre: Inde, velut ex alia radice letiores virent trunci: hos, qua natura fert, adolere non sinunt; quippe alium alii, quasi nexu consunt: qui ubi multa fronde vestiti sunt, operiunt terram. Itaque occulti ramorum velut laquei perpetua sepe iter claudunt, &c.* The *Trees* (saith he) were Planted so near and thick together of purpose, that when the boughs were yet young and flexible, bent, and wreath'd within one another, their Tops were bowed into the earth (as we submerge our Layers) whence taking fresh roots, they shot up new stems, which not being permitted to grow as of themselves they would have done, they so knit, and perplex'd one within another, that when they were clad with leaves, they even cover'd the ground, and enclosed the whole Country with a kind of living net, and impenetrable hedge, as the *Historian* continues the description; and this is not unlike what I am told is frequently practis'd in divers places of *Devon*; where the *Oaks* being planted very near the foot of those high *Mounds* by which they separate their *Lands*, so Root themselves into the *Bank*, that when it fails and crumbles down, the *Fence* continues still maintain'd by them with exceeding profit. Such works as these would become a *Cato*, or *Varro* indeed, one that were *Pater Patrie*, non sibi soli natus, born for Posterity; but we are commonly of another mould,

— & fruges consumere nati.

9. A fair advance for speedy growth, and noble *Trees* (especially for *Walks* and *Avenues*) may be assuredly expected from the *Grafting* of young *Oaks*, and *Elms* with the best of their kinds; and where the goodliest of these last are growing, the ground would be plow'd, and finely raked in the season when the *Scales* fall; that the throwres and dews fastning the *Seed* where the wind drives it, it may take Root, and hasten (as it will) to a sudden *Tree*; especially, if seasonable spreading be appli'd, which has sometimes made them arrive to the height of *Twelve* foot by the first three years, after which they grow again. And if such were planted as near to one another as in the *Examples* we have allegd'd, it is almost incredible, what a *paling* they would be to our most expos'd *Plantations*, mounting up their wooden *walls* to the clouds: And indeed the shelving, and natural declivity of the *Ground* more or less to our unkind *Aspects*, and bleak *Winds*, does best direct to the thickning of these protections; and the benefit of that, soon appear, and recompence our industry in the smoothness, and integrity of the *Plantations* so defended.

10. That great care be had of the *Seeds* which we intend to sow has been already advi'd; for it has been seen, that *Woods* of the same age, planted in the same soil, discover a visible difference in the *Timber* and *growth*; and where this variety should happen, if not from the seed, will be hard to interpret; therefore, let the place, soil and growth of such *Trees* from whence you have your seeds, be diligently examin'd; and why not this, as well as in our care of *Animals* for our breed and store?

11. As to the *Form*, obey the natural site, and submit to the several guizes; but ever declining to enclose *High-ways*, and *Common-Roads* as much as possible. For the rest, be pleas'd to reflect on what we have already said, to encourage the Planting of the large spreading *Oak* above all that species; the amplitude of the distance which they require resign'd to the care of the *Verderer* for grazing *Cattle*, *Deer*, &c. and for the great and masculine beauty which a wild *Quincunx*, as it were, of such *Trees* would present to your eye.

12. But to advance his *Majesties Forest*; to this height of perfection, I should again urge the removal of some of our most mischievously plac'd *Iron-mills*; if that at least be true which some have affirm'd, that we had better *Iron*, and cheaper from *Foreigners*, when those *Works* were strangers amongst us. I am inform'd, that the *New-English* (who are now become very numerous, and hindred in their advance and prospect of the *Continent* by their furthest of the *Woods* which we want) did about *twelve* years since, begin to clear their *High-ways* by two *Iron-mills*: I am sure their zeal has sufficiently wast'd our stately *Woods*, and *Steel* in the bowels of their *Mother* old *England*; and 'twere now but expedient, their *Brethren* should hasten thither to supply us with *Iron* for the peace

of

of our days; whilst his Majesty becomes the great Sovereign of the Ocean, free Commerce, *Nemorum Vindex & Insaurator magnus*. This were the only way to render both our Counties habitable indeed, and the fittest Sacrifice for the Royal Oaks, and their Hamadryads to whom they owe more than a slight submission: And he that should deeply consider the prodigious waste which these voracious Iron, and Glass-works have formerly made but in one County alone, the County of *Sussex*, for 120 Miles in length, and thirty in breadth (for so wide, and spacious was the ancient *Andradwald*, of old one intire Wood, but of which there remains now little, or no sign) would be touch'd with no mean Indignation: Certainly, the goodly Rivers and Forests of the other World, would much better become our Iron, and Saw-mills, than these exhausted Countries; and we prove gainers by the timely removal: I have said this already, and I cannot too often inculcate it for the Concerns of a Nation, whose only Protection (under God) are her Wooden Walls.

13. Another thing to be recommended (and which would prove no less than thirty years, in some places forty, and generally twenty years advance) were a good (if well executed) Act to save our Standards, and bordering Trees from the Ax of the Neighbourhood: And who would not preserve Timber, when within so few years the price is almost quadrupl'd? I assure you standards of twenty, thirty, or forty years growth, are of a long day for the Concernments of a Nation.

14. And though we have in our general Chapter of Copp'ces, declar'd what by our Laws, and common usage is expected at every Fell (and which is indeed most requisite, till our store be otherwise supply'd) yet might much even of that rigor be abated, by no unfrugal permissions to take down more of the Standards for the benefit of the Under-woods (especially where, by over-dropping, and shade they interrupt the kindly Dew, Rains, and Influences which nourish them) provided that there were a proportionable number of Timber-trees duly and thoroughly planted, and preserved in the Hedge-rows and Bordures of our grounds; in which case, even the total clearing of some Copp'ces would be to their great advance, as by sad experience has been taught some good *Husbands*, whose necessities sometimes forced them to violate their Standards, and more grown Trees during the late Tyranny.

15. Nor will it be here unreasonable to advise, that where Trees are manifestly perceiv'd to decay, they be marked out for the Ax, that so the younger may come on for a supply; especially, where they are chiefly Elms; because their successors hasten to their height and perfection in a competent time; but beginning once to grow sick of Age, or other infirmity, suddenly impair; and lose much of their value yearly: besides, that the increase of this, and other speedy Timber, would spare the more Oak for Navigation, and the sturdier uses.

How goodly a sight were it, if most of the Demesnes of our Country Gentlemen were crown'd and incircled with such stately

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rows of Limes, Firs, Elms, and other ample, shady and venerable Trees as adorn New-Hall in Essex, the Seat of that Suffolk Knight near Tarmouth, our neighbouring Pastures at Barnes; with what has been planted of later years by the illustrious Marquis of Worcester; the most accomplish'd Earl of Essex; and even in less fertile Soils, though purer air at Enson, by the Right honourable the Earl of Arlington, Lord Chamberlain of his Majesty's Household: and at Cornberry by the late Lord Chancellor the Earl of Clarendon; and is done, nearer this Imperial City, by the noble Earl of Danby, Lord High Treasurer of England, at his seat in Wimbledon; and above all, his Sacred Majesty, in his Parks of Greenwich, St. James's, Hyde-Parke, Hampton-Court and Windsor, leading the way to these glorious Heroes; and yet were these Plantations but of late years in comparison: It were a noble, and immortal providence to imitate these good Husbands in the largest, and more august Plantations of such useful Trees, for Timber and Fuel, as well as for Shade, and Ornament to our Dwellings.

It is here therefore great Persons would be incited by all the rules and Methods imaginable, to adorn their goodly Seats, and Mansions with stately Walks and Avenues, their Groves, Parks, and Woods with Trees of the most venerable Shade, and profitable Timber, and to Cut, and dispose those ampler Enclosures into Lawns, and Ridings for exercise, health, and Prospect, and for which I should here presume to furnish some directions, were it not already done to my hand by the often cited Mr. Cooke, in that useful work of his; where, in Chapter the 38th, he has laid down all that I can conceive necessary, by measures exactly taken from the middle-line of any front, following the center stake, if it be for a Walk: He there determines the wideness of the walk, according to its length, as 40 Foot to one of half a mile; if more, 50 or 60; and if you wishal desire shade, that then you should make 3 walks, the two collaterals 40 Foot broad, to a middle-one of 40.25 to 50, so that the middle be as wide as both the other: He likewise shews how proper it is that Walks should not terminate abruptly, but rather in some capacious, or pretty figure, be it Circle, Oval, Semi-Circle, Triangle, or Square, especially in Parks, or where they do not lead into other Walks; and even in that case, that there may gracefully be a Circle to receive them: There he shews how to pierce a Walk through the thickest Wood either by stakes set up where they may be seen to direct; or by Candle and Lantern, in a calm night, &c. He also gives the distances of the Trees in relation to each other, according to the species, and shews how necessary it is, to plant them nearer in those Ovals, Circles, and Squares, &c. for the better distinction of the Figures, suppose to half the distance of that of the Walks, and proportionable to the amplitude, or smallness thereof: As for Lawns, he advises that they should (if possible) be contriv'd on the South or East side of the Seat and Mansion, for avoiding the impetuoufness of Western winds; and that your best Rooms may front those Lawns and openings, and to skreen from the occidental and after-noons Sun

which

which also hinders *prospect*: A *Lawn* on the *North*, exposes the *House* to that piercing quarter, and therefore it would be well defended with the tallest *Trees*: For the figure he commends the *square*, with three *Avenues* breaking out at the three *Angles*, or one at the *Angle* opposite to the *House*, and these *Lawns* may be bounded with *walks*, or a single row of *Lime-trees* at competent distances: to which I add, the *Circle* with a *star* of *Walks* radiating from it likewise exceeding pleasant; such as the Right Honourable the *Earl of Winchelsea* has cut out at his noble seat in *Kent*: It were likewise graceful the *Black-cherry*, are proper to be planted, kept, and govern'd skilfully; and what if *Ten*, or *Holly* made an *Hedge* from *Tree* to *Tree* in some places for diversity, leaving a *knob*, *pyramide*, or *standard* in the middle for variety; especially about the *Area* next the *House*, and in some of those *Figures* and openings at the period of *Walks* and *Lawns*, it is not to be imagin'd how suprisingly noble it would shew, they being not only *ever-greens* but *conspicuous*, and hardy against all invasions of *weather* or *Cattel*, and will infallibly thrive under the shade of the larger *Trees*, which neither *Juniper* nor *Cypress* will endure.

16. But these incomparable *Amenities* and undertakings will best of all become the *Inspection* and care of the noble *Owners*, *Lieutenants*, *Rangers*, and ingenious *Gentlemen* when they delight themselves as much in the goodness of their *Trees*, as other men generally do in their *Dogs*, and *Horses*, for *Races*, and *Hunting*; neither of which *Recreations* is comparable to that of *Planting*, either for *Virtue*, or *Pleasure*, were things justly consider'd according to their true estimation: Not yet that I am of so morose an *humour*, that I reprove any of those noble, and manly *Diversions*, seasonably us'd; but because I would court the *Industry* of great and opulent persons, to profitable, and permanent *delights*: For, suppose that *Ambition* were chang'd into a laudable emulation, who should best, and with most artifice, raise a *Plantation* of *Trees*, that should have all the proper *Ornaments*, and *perfections* their nature is susceptible of, by their direction and encouragement; such as *Aelian* sums up *lib. 3. c. 14.* *ὀρενέας οἰκιστὰς, ὃ δὲ κερύει πικρὸν, &c.* kind, and gentle *Limbs*, plenty of large *leaves*, an ample, and fair *body*, profound, or spreading *Roots*, strong against impetuous *Winds* (for so I affect to read it) extensive, and venerable *shade*, and the like: Methinks there were as much a subject of *Glory* as could be phancied of the kind; and comparable, I durst pronounce, preferable, to any of their *Recreations*; and how goodly an *Ornament* to their *Demesnes* and *Dwellings*, let their own eyes be the judges.

17. One *Encouragement* more, I would reinforce from an *History* I have read of a certain frugal, and most Industrious *Italian Noble-man*,

ble-man, who, after his *Lady* was brought to Bed of a *Daughter*, considering that *Wood* and *Timber* was a *Revenue* coming on whilst the *Owners* were asleep; commanded his *Servants* immediately to Plant in his *Lands* (which were ample) *Oaks*, *Ashes*, and other profitable, and *Marketable Trees*, to the number of an *Hundred thousand*; as undoubtedly calculating, that each of those *Trees* might be worth *twenty pence*, before his *Daughter* became *Marriageable*, which would amount to 100000 *frances* (which is near ten thousand pound *Sterling*) intended to begin with his *Daughter* for a *Portion*. This was good *Philosophy*, and such as I am assur'd is frequently practis'd in *Flanders* upon the very same account: Let us see it once take effect amongst our many slothful *Gentry*, who have certainly as large *Demesnes*, and yet are so deficient in that decent point of *timely* providing for their numerous *Children*: And those who have none, let them the rather *Plant*: *Trees* and *Vegetables* have perpetuated some *Names* longer, and better than a *Pedigree* of a numerous *Off-springs*; and it were a pledge of a *Noble Mind*, to oblige the future *Age* by our particular *Industry*, and by a long lasting train, with the *living work* of our own hands: But I now proceed to more general *Concerns*, in order to the *Queries*, and first to the *proportion*.

18. It were but just, and infinitely besitting the miserable needs of the whole *Nation*, that every *twenty Acres* of *Pasture*, made an allowance for half an *Acre* of *Timber*; the *Ground* dug about *Christmas*, casting the *Grassy-side* downwards till *June*, then dug again, and about *November* stir'd afresh, and sown with *Mast*, or planted in a *clump*, well preserv'd, and sown'd for 14, or 15 years; unless that *Sheep* might haply *Graze* after 4 or 5 years: And where the young *Trees* stand too *Thick*, there to *draw*, and *transplant* them in the *Hedge-rows*, which would also prove excellent *shelter* for the *Cattel*: This *Husbandry* would more especially become *Northamptonshire*, *Lincolnshire*, *Cornwall*, and such other of our *Countries* as are the most naked of *Timber*, *Fuel*, &c. and unprovided of *covert*: For it is rightly observ'd, that the most fruitful places, least abound in *wood*, and do most stand in need of it.

I.

Example by Leicestershire,

What soil can be better than that

For any thing heart can desire?

And yet doth it want ye see what:

Grass, Covert, close pasture, and Wood,

And other things needfull, as good.

2.

More plenty of Butten and Beef,

Corn, Butter, and Cheese of the best,

More wealth any where (to be brief)

More people, more handloom, and yest,

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Where

Where find ye (go, search any coast)
Than there where Inclosure is most?

3.

More work for the labouring man,
As well in the Toun as the field;
Or thereof (vedgize, if ye can)
More profit what Countreies do yield?
More seldom where see ye the pooz
So begging from dooz to dooz?

4.

In Wood-land the pooz men that have
Scarce fully two Acres of Land,
More merrily lye, and do labe
Than t'other with twenty in hand:
Yet pay they as much for the two
As t'other for twenty must do.
If this same be true, as it is,
Why gather they nothing by this?

Thus honest *Tisser* an hundred years since, and the whole age has justified it, since 'tis evident, that by *Inclosure*, and this diligent *Culture*, the very worst land of *England* would yield ten fold more profit, than that which is here celebrated for the best and richest spot of it.

19. Such as are ready to tell ye their *Lands* are so wet, that their *Woods* do not thrive in them; let them be converted to *Pasture*; or bestow the same industry on them which good *husbands* do in *Meadows* by *draining*: It is a slothfulness unpardonable; as if the *pains* would not be as fully recompenc'd in the growth of their *Timber*, as in that of their *grass*: Where poor hungry *Woods* grow, rich *Corn*, and good *Cattle* would be more plentifully bred; and it were beneficial to convert some *Wood-land* (where the proper virtue is exhausted) to *Pasture* and *Tillage*; provided, that fresh land were improved also to *wood* in recompence, and to balance the other.

20. Where we find *unliginous* and starv'd places (which sometimes obey no Art or Industry to *drain*, and of which our pale and fading *Corn* is a sure indication) we are as it were courted to obey *Nature*, and improve them for the propagation of *Sallows*, *Willows*, *Alders*, *Able*, *Black-cherry*, *Sycamore*, *Aspine*, *Birch*, and the like hasty, and profitable growers, by ranging them, casting of *Ditches*, *Trenches*, &c. as before has been taught.

21. In the mean while, 'tis a thing to be deplor'd, that some persons bestow more in *grubbing*, and dressing a few *Acres* which have been excellent *Wood*, to convert them into wretched *pasture*, not worth a quarter of what the *Trees* would have yielded, well order'd,

der'd, and left standing; since it is certain, that *barren land* planted with *wood*, will trebble the expence in a short time. Of this, the Right Honourable the Lord Viscount *Scudamor* may give fair proof, who having sell'd (as I am credibly inform'd) a decay'd *Wood*, intended to be set to *Tenants*; but upon second thoughts (and for that his Lordship saw it apt to cast *Wood*) enclos'd and preserv'd; it yielded him, before thirty years were expir'd, near 1000 pound upon *Wood-Fall*, whereas the utmost *Rent* of the whole price of *Land* yearly, was not above 8 pound 10 shillings. The like I am able to confirm by instancing a noble Person, who (a little before our unhappy *Wars*) having fown three or four *Acres* with *Acorns*, the fourth year transplanted them which grew too thick all about his Lordship: These *Trees* are now of that *stature*, and so likely to prove excellent *Timber*, that they are already judg'd to be almost as much worth as the whole *Demesnes*; and yet they take off nothing from other profits, having been discreetly dispos'd of at the first *designment*. And supposing the *Longevity* of *Trees* should not extend to the *Periods* we have (upon so good account) produc'd; Yet, neither is their arrival to a very competent *perfection*, so very discouraging; since I am credibly inform'd, that several Persons have built of *Timber* (and that of *Oak*) which were *Acorns* within this forty years; and I find it credibly reported, that even our famous *Forest* of *Dean*, hath been utterly wasted no less than three several times, within the space of Nine-hundred years. The Prince Elector *Frederic* IV. in the year 1606. sow'd a part of that most barren Heath of *Lambertheim*, with *Acorns* after *plowing*, as I have been inform'd; it is now likely to prove a most goodly *Forest*, though all this while miserably neglected by reason of the *Wars*. For the care of *Planting Trees*, should indeed be recommended to *Princes* and great Persons, who have the *Fee* of the *Estate*; *Tenants* upon the *Rack* by reason of the tedious expectation, and jealousy of having their *Lands* enhanc'd, are for the most part averie from this *Husbandry*; so that unless the *Land-Lord* will be at the whole *Charge* of *Planting*, and *Fencing* (without which as good no *Planting*) little is to be expected; and whatsoever is propos'd to them above their usual course, is look'd upon as the *whim* and fancy of *speculative* Persons, which they turn into *ridicule* when they are applied to *Action*; and this, (says an ingenious and excellent *Husband* whose *Observations* have afforded me no little treasure) might be the reason, why the prime *Writers* of all *Ages*, endeavour'd to involve their *Discourses* with *Allegories*, and *Enigmatical* terms, to protect them from the contempt, and pollution of the *Vulgar*, which has been of some ill Consequence in *Husbandry*; for that very few *Writers* of worth, have adventured upon so plain a *Subject*, though doubtless to any *Considering Person*, the most *Delightful* kind of *Natural Philosophy*, and that which employs the most useful part of the *Mathematicks*.

The Right Honourable my Lord Viscount *Mountague* has Planted many thousands of *Oaks*, which I am told, he draws out of
F i 2
Coppices,

Copp'ces, big enough to defend themselves; and that with such success, as has exceedingly improv'd his *Possessions*; and it is a worthy *Example*. To conclude, I can shew an *Avenue* Planted to a House standing in a barren *Park*, the Soil a cold *Clay*; it consists totally of *Oaks*, one hundred in number: The *person* who first set them (dying very lately) lived to see them spread their *branches* 123 foot in compass, which at distance of 24 foot, mingling their shady *treffes* for above 1000 in length, form themselves into one of the most venerable, and stately *Arbor-walks*, that in my life I ever beheld: This is at *Baynards* in *Surrey*, and belonging lately to my most honor'd Brother (because a most industrious *Planter* of Wood) *Richard Evelyn* Esq; since transplanted to a better world: The Walk is broad 36 foot, and one *Tree* with another containing by estimation three quarters of a load of *Timber* in each *Tree*, and in their tops three *Cords* of fire-wood: Their *Bodies* are not of the tallest, having been topped when they were young, to reduce them to an uniform height; yet is the *Timber* most excellent for its scantling, and for their *heads*, few in *England* excelling them: where some of their contemporaries were planted single in the *Park* without cumber, they spread above *four-score* foot in arms.

22. But I have some few *Instances* to superadd, of no mean *Encouragement*, before I dismiss my *Reader*, because they are so very pregnant and authentick: Sir *Tho. Southwel*, after he had sold, and sell'd all the *Timber*, and *Under-wood* in a certain parcel of Land lying in *Carbrook*, in the *County* of *Norfolk*, call'd by the name of *Latimer Wood*; containing 80 *Aces* (now, as I understand, belonging to Sir *Rob. Clayton* Knight) granted a *Lease* of the said Ground, with other Land, to one *Tho. Wafney* (the *Father*) with liberty to grub and stub-up all the *Wood* and *Stub-shoots* remaining, and to clear the said Ground for *Pasture* or *Tillage*, as he should think to be most for his Profit and advantage: Accordingly he puts out the same to *Labourers* to *Stub*, and *clear*; but was it seems, perswaded by one of them, to preserve some of the young *Stands* or *Saplings* then growing there, as that which might be of greater emolument to him before the expiration of the *Lease*, than if he should quite extirpate them, and convert the said Ground to *Tillage*: These *Saplings* were then so small, as when it happen'd that any of the *Labourers* did break the *hust* of his *Mattock*, he could hardly find one amongst them, big enough to make another of for his present use: Nay when the said *Labourers* had made an end of clearing the Ground of the old *Stub-shoots*, upon which the *Timber* and *under-Wood* did grow (which is now 30 years since) there was not a *Tree* left growing in it, that could be valued at above *Three Pence* to be sell'd for any use or service: About the year 1650, the *Estate* being then come (after the death of Sir *Rich. Crane* Knight) to *William Crane* Esq; and the *Lease* of the same to *Tho. Wafney* (the *Son*) he offered 500 of the best of the said young *Oak-Saplings* to one *Daniel Hall* (a dealer in *Timber*) for two-Shillings and Six-pence the *Tree*; which he refusing to give, the said *Tho. Wafney*, making his application to

Mr. Crane

Mr. *Crane* above mention'd (then owner of the *Estate*) and desiring *Daniel Hall* to acquaint him what pity it was to cut-down such young, and thriving *Trees*; Mr. *Crane* was perswaded to allow the said *Tho. Wafney* four-score pounds, and to let them stand; since which time, the said Mr. *Crane* sold as many of those *Trees* and *Saplings*, as came to about forty pounds, and left growing, and remaining on the Ground about 1380 *Trees*; which, in August 1675 being (upon the desire of Mr. *Crane*) valued by the said *Daniel Hall*, were estimated to be worth 700 l. himself since offering for some of the said *Trees* 40 and 50 Shillings a *Tree*; 500 of them being better worth than 500 l. Now the said *Latimer Wood* were it clear'd of the *Timber*, would not be let for above four, or five Shillings per *Acre* at the most. The particulars of this *History* I received under the hands, and *Certificates* of the above mention'd *Daniel Hall*, who is the *Timber Merchant*, and two of the *Stubbers* or *Labourers* (yet living) that were employ'd to clear the Ground. I have likewise transmitted to me this account from Mr. *Sharp*, under the hand of *Robert Daye* Esq; one of his *Majesties Justices* of the Peace for the *County* of *Norfolk* as followeth.

There were in 1636. an hundred *Timber Trees* of *Oak*, growing on some Grounds belonging then to *Thomas Day* of *Scampton* in the *County* of *Norfolk* Esq; which were that year sold to one *Rob. Bomegon* of *Hingham* in the said *County*, for 100 l. which price was believed to equal, if not to surmount their intrinsic worth, and value; for, after Agreement made for them, a *Refusal* happening (which continu'd the *Trees* standing till the Year 1671) those very *Trees* were sold to *Tho. Ellys* of *Wudham* (*Timber Master*) and one *Hen. Morley*, *Carpenter*, by Mr. *Day* (*Son* of the said *Thomas Day* Esq;) for 560 l. pounds: And this comes to me Attested under the hand of *Elquire Day* himself, dated 4 May 1678.

From the same Mr. *Sharp* I receive this Instance of an *Ash* planted by the hands of one Mr. *Edm. Salter* in that *County*, which he sold for 40 s. before his death, but this is frequent.

I am likewise assur'd that three *Aces* of barren land, sown with *Acorns* about 60 years since, and now become a very thriving *Wood*, the improvement of those few *Aces* amounts to 300 l. more than the *Rent* of the *Land*, and what it was before worth to be sold: Once more and I have done.

Upon the *Estate* of *George Pitt* Esq; of *Stratfieldsea* in the *County* of *Southampton*, a Survey of *Timber* being taken in the year 1659, it came to 10300 l. besides near 10000 *Saplers* not valu'd, and growing up naturally: Since this, there hath been made by several sales 5600 l. and there has been sell'd for *Repairs*, *Building* and necessary Uses to the value (at the least) of 1200 l. so as the whole fall of *Timber* amount to 6800 l. The *Timber* upon the same Ground being again Survey'd Anno 1677, appears to be worth above 21000 l. besides 8, or 9000 *Saplers*, and young *Trees* to be left standing, and not reckon'd in the Survey: by what

what is yet to be observ'd most of this *Timber* above mention'd, being *Oak*, grows in *Hedge-rows*, and so as that the standing of it, does very little prejudice to the *Plow* or *Pasture*.

It is likewise affirm'd, that upon a *Living* in the same place, of about forty pound per *An. Rent*, there was (by an estimation taken in the year, 1653.) three hundred thirty eight young *Timber Trees* valu'd at fifty nine pound; the *Suplings* at thirty one pound fourteen shillings: And upon a later *Survey* taken the last year 1677; the worth of the *Timber* on that *Living*, is valu'd at above eight hundred pound, besides four or five hundred young thriving *Trees*, which have since the *Survey* in 1653. grown naturally up, not reckon'd in this *Account*. With such, and the like *Instances*, coming to me from *Persons* and *Gentlemen* of unquestionable credit (dispers'd through several other *Counties* of this *Nation*) I might furnish a just *Volume*; and I have produced these *Examples*, because they are conspicuous, full of encouragement, worthy our imitation; and that from these, and sundry others which I might enumerate, we have made this *Observation*, that almost any *Soil* is proper for some profitable *Timber-Trees* or other, which is good for very little else.

23. Besides *Common pasture* which has long been fed, and is the very best *Meadow*, that is up-land and rich, and such as we find to be naturally *Wood-ferre* (as they term it) the bottoms of *Downs*, and like places well *Plow'd*, and *sown* will bear lusty *Timber*, being *broken up*, and let lie till *Midsummer*, and then *sirr'd* again before *sowing* about *November*.

Mr. Cook's directions are these: Prepare as for sowing of *Early*, about *February* scatter your seeds: If you *Plow* your ground into great *Ridges*, the thickness of the Earth on the top will afford more depth and nourishment for the *Roots*, and the furrows being filled up with leaves, when rotten, will lead the *Roots* from one ridge to another: In dry ground *Plow* the ridges cross the descent, not to *drain* but keep the water on the ground, but in wet lands, contrary: This I hold to be an excellent note: He conceives the *Early* season to be of the latest to sow your *Seeds*, but with *Oats* it does well, so you sow them not too thick; but 'tis best of all to sow them by themselves without any *Crop of Grain* at all.

A more expeditious way is to plant with *Sets*, making *holes* or *fosses* (which are best) two foot wide, and deep, and about half a *Rod* distant, viz. four in every *Rod* square, two *Sets* in each hole, sowing your *Keys* and *Seeds* among them the ensuing *Spring*, and that continu'd as oft as you find *Stampings* and *Keys* to be had, even till your *Wood* be perfectly furnish'd, only taking care that they lie not long too thick, because it will heat, and burn the *Kernels*, and therefore let them be put into the ground as soon as they are press'd, or else lay them thin or parted with *straw*.

In case your land be poor and wanting depth, or but indifferent, observing the posture of your ground, divide it into four *yards* distance at both extremes, by small *stakes*, making rows of them by setting up some few between them to direct, and lay your work straight,

straight, ploughing one *yard* of each side of the *stake*, if the ground be *Green-sward* for the easier running of the *Roots*: Having thus plough'd two *yards*, and left two unplow'd through your whole piece some short time before planting season, so soon as the fall of the leaf begins; Dig up the unplow'd *interstices*, laying one half of the Earth on the unplow'd pieces, and the other half upon the rest, and as you do this, plant your prepared *Sets* about a *yard* distant, with store of *Sallow*, or other *Cuttings* with them, digging that ground which you laid on the plow'd part a good *Spade* deep, which will make it near a foot thick to plant your *Sets* in: Thus proceed from one unplow'd ground to another till all of it is planted: Two men on each side of the *Ridges*, will soon dispatch the work, which would be finish'd by the later end of *January*, which is the best time for the sowing your *Keys*, *Nuts*, and other *Seeds*, unless the weather be frosty, in which case you may a little defer it: And when all is sow'd, cover them a little with the shovellings of some ditches, pond, or other stuff, as an assured good way to improve such *Grounds*, to considerable advantage.

For the Planting of *Walnuts*, *Chestnuts*, *Cider-Apples* or any other *Forest*, or *Fruit-Tree* in open fields, Mr. Cook directs how the *Triangular* form exceeds all the rest for beauty, and advantage: I refer you to his 33 *Chap.*

An old, and judicious Planter of *Woods*, prescribes us these *Directions*, for improving of *sheep-walks*, *Downs*, *Heaths*, &c. Suppose, on every such *Walk* on which 500 *Sheep* might be kept, there were *Plow'd* up twenty *Acres* (*Plow'd* pretty deep, that the *Roots* might take hold, and be able to resist the *Winds*) this should be sowed with *Mast* of *Oak*, *Beech*, *Chats* of *Ash*, *Maple keys*, *Sloes*, *Service-berries*, *Nuts*, *Bulls*, &c. bruise'd *Crabs* and *Haws*; mingled and scatter'd about the sides and ends of the *Ground*, near a *yard* in breadth. On the rest sow no *Haws*, but some few *Crab-kernels*: Then begin at a *side*, and sow five *yards* broad, *Plowing* under the *Mast*, &c. very shallow; then leave six *yards* in breadth, and sow, and *Plow* five *yards* more, and so from side to side; remembering to leave a *yard* and half at the last side; let the rest of the *head-lands* lie, till the remainder of the *Glose* be sown in *March* with *Oats*, &c. to preserve it from hurt of *Cattel*, and potching the *Ground*; when the *Spring* is of two years growth, draw part of it for *Quick-sets*; and when the rest of the *Trees* are of six years shoot, exhaust it of more; and leave not above forty of either side, each row five *yards* distant; and here, and there a *Crab-stock* to graff on, and in the invironing *Hedge* (to be left thick) let each *Tree* stand four *yards* asunder; which if forty four were spared, will amount to about 4000 *Trees*: At twenty years end stock up 2000 of them, lop a thousand more every ten years, and reserve the remaining thousand for *Timber*: Judge what this may be worth in a short time, besides the *Graff*, &c. which will grow the first six or seven years, and the benefit of shelter for *sheep* in ill Weather, when they cannot be folded; and the *Pasture* which will be had under the *Trees*, now at eleven *yards* interval, by reason of

of the *stocking* up those 2000 we mention'd. excepting the *Hedges*; and if in any of these *Places* any considerable *waters* fortune to lie in their bottoms, *Fowl* would abundantly both *breed*, and *harbour* there. These are admirable Directions for *Park-lands* where *pasture* and *Food* is scarce.

But even this *Improvement* yet does no way reach, what I have met withal in the most accurate, and no less laborious Calculation of Captain *Smith* upon this very *Topic*; where he *Demonstratively* asserts, that a *thousand Acres of Land*, Planted at one foot interval, in 7201 rows; taking up 51854401 Plants of *Oak*, *Ash*, *Chestnut* (or to be *sown*) taking up 17284800 of each sort, and fit to be *transplanted* at three years period (if set in good ground) are worth *eighteen pence* the hundred; and there being 345696 hundred, it amounts to no less than 25927 l. 4 s. besides the *Chestnuts*, of which there being 1728480 l. (valued at and worth half a *Crown* the Hundred) they come to 21606 l. and the total of all, to 47533 l. 4 s.

This being made out, consider what an immense sum, *great Trees* would amount to, and in a large quantity of *Land*; such as were worthy a *Royal* undertaking: It is computed, that at *three* foot distance, the first *Felling* (that is, eight, or nine years after their *Planting*) would be worth in *Hoops*, *Volers*, *Firing*, &c. 55015 l. and the second *Fell*, 28657 l. 19 s. 5 d. And the fourth (which may be about thirty two years from their *Semination*) 90104 l. 17 s. and so forward.

At four foot interval, and *Felling*, according to the same proportion, you may likewise reckon; and in 11 years with three years *Crop of Wheat* (sow'd at first between) it will amount to 34001 l. 9 s. 4 d. And the next, very much more; in regard the *Wood* will spring up thicker: So as at the fifth *Fell*, the account stands 126992 l. 10 s. 2 d. 8 c. and at the seventh (whoever lives to it) 200000: And if planted at wider distance, viz. 18 feet (according to the *Captain's* method) at 30, or 40 years growth you may compute them worth 192961 l. 6 s. And in seventy years, 201001; besides the three years crop of *Wheat*, in all 410312 l. 16 s. which at 36 foot interval (accounted the utmost for *Timber*) takes up (for 1000 Acres) 40401 *Trees* for the first 100 years. Then,

To make room, as they grow larger, grubbing up every middle Tree, at 9 l. per Tree, 19800 *Trees* amount to 99000 l. and the remaining 20601 at 220 years growth, at but 8 l. per Tree, comes to 164808 l. besides the inferior *Crop of Meadow*, or *Corn* in all this time, sown in the distances; reckoning for three years product 90000 *Busbels* at 5 s. per *Busbel*, which will amount to 22500 l. besides the *Straw*, *Chaff*, &c. which at 5 s. a Load, and 3 d. a *Busbel* *Chaff*, comes to 2025 l. So as the total *Improvement* (besides the 217 years emolument arising from the *Corn*, *Cattel*, &c.) amounts to 288333.

And these *Trees* (as well they may) coming to be worth for *Timber*, 20 l. an *Oak*; the 20601 *Trees* amount to 412020 l. and the

the total *Improvement* of the 1000 Acres (the *Corn* Profits not computed) ascends to 675833 l. So as admit there were in all *England* (and which his Majesty might easily compass, even for his own *Proportion*, and for *Posterity*) 20000 Acres thus Planted, at two foot diameter (and as may be presum'd thirty foot high, which in 150 years, they might well arrive to) they would be worth 13516660 l. an immense and stupendious Summe, and an everlasting supply for all the *Uses* both of *Sea* and *Land*: But it is to Captain *Smith's* laborious Works (to which I with all encouragement) that we have the total *Charge* of this noble *Undertaking* from the first *Semination*, to their maturity; by which it will be easy to compute what the *Gains* will be for any greater or lesser quantity.

But now to return to the *Place of Planting* (from whence this *Calculation* has more than a little diverted) we shall find, as we said, that even in the most craggie, uneven, cold and exposed places, not fit for *Arable*, as in *Biscay*, &c. and in our very Peaks of *Derbyshire*, and other *Rockie* places, *Ashes* grow about every *Village*, and we find that *Oak*, *Beech*, *Elm*, and *Ash*, will prosper in the most stony Soils. And it is truly from these *Indications*, more than from any other whatsoever, that a broken, and decaying Farmer, is to be distinguish'd from a substantial *Freeholder*, the very *Trees* speaking the conditions of the *Master*: Let not then the *Royal Patrimony* bear a *Bankrupt's* reproach: But to descend yet lower;

24. Had every *Acre* but three, or four *Trees*, and as many of *Fruit* in it as would a little adorn the *Hedge-rows*, the *Improvement* would be of fair advantage in a few years; for it is a shame that *Turnip-planters* should demolish, and undo *hedge-rows* near *London*, where the *Mounds* and *Fences* are stripp'd naked, to give *Sun* to a few miserable *Roots*, which would thrive altogether as well under them, being skilfully prun'd and lopp'd: Our *Gard'ners* will not believe me, but I know it to be true, though *Pliny* had not affirm'd it: As for *Elms* (saith he) their *Shade* is so gentle and benigne, that it nourishes whatsoever grows under it: And (*lib. 17. c. 22.*) it is his opinion of all other *Trees* (very few excepted) provided their Branches be par'd away, which being discreetly done, improves the *Timber* as we have already shew'd.

25. Now let us calculate a little at adventure, and much within what is both feasible, and very possible; and we shall find, that four *Fruit-trees* in each *Acre* throughout *England*, the product fold but at six pence the *Busbel* (but where do we now buy them for cheap?) will be worth a *Million* yearly: What then may we reasonably judge of *Timber*, admit but at the growth of four pence per *Acre* yearly (which is the lowest that can be estimated) it amounting to near two *Millions*? if (as 'tis suppos'd) there may be five or six and twenty *Millions* of *square Acres* in the Kingdom (besides *Fens*, *High-ways*, *Rivers*, &c. not counted) and without reckoning in the *Mast*, or *loppings*; which whosoever shall calculate from the annual *Revenue*, the *Mast* only of *Westphalia*, a small and wretched Country in *Germany*, does yield to that

K k

Prince,

Prince, will conclude to be no despicable Improvement.

26. In this poor Territory, every Farmer does by antient custom, Plant so many Oaks about his Farm, as may suffice to feed his Swine: To effect this they have been so careful, that when of late years, the Armies infected the poor Country, both Imperialists, and Protestants; the only Bishoprick of Munster was able to pay One hundred thousand Crowns per annum (which amounts of our money to about 25000 l. sterling) besides the ordinary entertainment of their own Prince and private families. This being incredible to be practis'd in so extrem barren a Country, I thought fit to mention, either to encourage, or reproach us: General Melander was wont to say, The good Husbandry of their Ancestors had left them this Stock *pro sacra Anchorâ*; considering how the People were afterward reduc'd to live even on their Trees, when the Soldiers had devour'd their Hogs; redeeming themselves from great extremities, by the Timber which they were at last compelled to cut down, and which, had it continu'd, would have prov'd the utter desolation of that whole Country. I have this Instance from my most worthy, and honourable Friend Sir William Curisus (his Majesties Resident in Germany) who receiv'd this particular from the mouth of Melander himself: In like manner, the Princes, and Freedoms of Hesse, Saxony, Thuringia, and divers other places there, make vast incomes of their Forest-fruits (besides the Timber) for Swine only. I say then, whosoever shall duly consider this, will find Planting of Wood to be no contemptible Addition; besides the Pasture much improv'd, the cooling of fat, and heavy Cattel, keeping them from injurious motions, disturbance, and running as they do in Summer to find shelter from the heat, and vexation of Flyer.

27. But I have done, and it is now time for us to get out of the Wood, and to recommend this, and all that we have propos'd, to His most Sacred Majesty, the Honourable Parliament, and to the Lord high Treasurer, Principal Officers, and Commissioners of the Royal Navy; that where such Improvements may be made, it be speedily, and vigorously prosecuted; and where any defects appear, they may be duly reformed.

28. And what if for this purpose there were yet some additional Office constituted, which should have a more universal Inspection, and the charge of all the Woods and Forests in His Majesties Dominions? This might easily be perform'd by Deputies in every County; Persons judicious, and skilful in Husbandry; and who might be repair'd to for advice and direction: And if such there are at present (as indeed our Laws seem to provide) that their Power be sufficiently amplified where any thing appears deficient; and as their zeal excited by worthy encouragements, so might neglects be encounter'd by a vigilant and industrious Cheque. It should belong to their Province, to see that such Proportions of Timber, &c. were Planted, and set out upon every hundred, or more of Acres, as the Honourable Commissioners have suggested; or, as might be thought convenient, the quality, and nature of the places

places prudently consider'd: It should be their Office also, to take notice of the growth, and decay of Woods, and of their fitness for publick use and sale, and of all these to give Advertisements, that all defect in their ill governing may be speedily remedied; and the Superiour Officer, or Surveyor, should be accountable to the Lord Treasurer, and to the principal Officers of his Majesties Navy for the time being: And why might not such a Regulation be worthy the establishing by some Solemn, and publick Act of State, becoming our glorious Prince, SOVEREIGN OF THE SEAS, and his prudent Senate, this present Parliament?

29. We find in Aristotles Politics, the Constitution of Extra-urban Magistrates to be Sylvorum Custodes; and such were the Con-sulares Sylvæ, which the great Cæsar himself (even in a time when Italy did abound in Timber) Instituted; and was one of the very first things which he did, at the settling of that vast Empire, after the Civil Wars had exceedingly wasted the Country: Suetonius relates it in the Life of Julius; and Peter Crinitus in his fifth Book De honesta disciplina, c. 3. gives this reason for it, *Ut materies (saith he) non deesset, qua videlicet Naevigia publica possent à præfecturis fabricum, confici*: True it is, that this Office was sometimes call'd Provincia minor; but for the most part, annex'd, and joyn'd to some of the greatest Consuls themselves; that facetious sarcasme of the Comedian (where Plautus names it Provincia caudicaria) referring only to some under Officer, subservient to the other: And such a Charge is at this day extant amongst the noble Venetians, who have near Triovis (besides what they nourish in other places) a goodly Forest of Oaks, preserv'd as a Jewel, for the only use of the Arsenal, call'd the Montello, which is in length twelve Miles, large five, and near twenty miles in compass; carefully supervised by a certain Officer, whom they name il Capitano; and we might Instance in many other prudent States; not to importune you with the express Laws which Ancus Martius the Nephew of Numa, and other Princes long before Cæsar, did ordain for this very purpose; since indeed, the care of so publick, and honourable an Enterprize as is this of Planting, and Improving of Woods, is a right noble, and Royal undertaking; as that of the Forest of Dean, &c. in particular (were it bravely manag'd) an Imperial design; and I do pronounce it more worthy of a Prince, who truly consults his glory in the highest Interest of his Subjects, than that of gaining Battels, or subduing a Province: And if in saying so, or any thing else in this rustic Discourse, I have us'd the freedom of a plain Forester; it is the Person you command me to put on, and my plea is ready,

Δρυὸς πνεύσας, πῶς ἀνὴρ ἐυλαβέσται.

Præsente Quercu, ligna quovis colligit.

for who could have spoken less upon so ample a Subject? and therefore

therefore I hope my *zeal* for it in these *Papers*, will (besides your *Injunctions*) excuse the prolixity of this *Digression*, and all other the *Imperfections* of my Services.

Si canimus Sylvas, Sylva sunt Confule digna.

CHAP. XXXV.

An Historical Account of the Sacredness, and Use of standing Groves, &c.

1. **AND** thus have we finish'd what we esteem'd necessary for the Direction of *Planting*, and the *Culture* of *Trees* and *Woods* in general; whether for the raising of *new*, or preservation of the more *Antient* and venerable *shades*, crowning the brows of lofty *Hills*, or furnishing, and adorning the more fruitful and humble *Plains*; *Groves* and *Forests*, such as were never Prophan'd by the Inhumanity of *Edge-tools*: *Woods*, whose Original are as unknown as the *Arcadians*; like the goodly *Cedars* of *Libanus*, *Psalm* 104. *Arbores Dei* according to the *Hebrew*, for something doubtless which they noted in the *Genius* of those *Venerable* places besides their meek bulk and Stature: And verily, I cannot think to have well acquitted my self of this useful *Subject*, till I shall have in some sort vindicated the honour of *Trees*, and *Woods*, by shewing my Reader of what Estimation they were of old for their *Divine*, as well as *Civil* Uses; at least refresh both *Him*, and my *self*, with what occurs of *Historical* and *Instructive* amongst the Learned concerning them. And first, *standing Woods* and *Forests* were not only the *original Habitations* of *Men*, but the first occasion of that *speech*, *Polity*, and *Society* which made them differ from *Beasts*. This, the Architect *Vitruvius* ingeniously describes, where he tells us that the violent percussion of one *Tree* against another forced by an impetuous *Wind*, setting them on *fire*, the flame did not so much surprise, and affright the salvage *Foresters*, as the *Warmth*, which (after a little gazing at the unusual accident) they found so comfortable; This (says he) invited them to approach it nearer, and as it spent and consum'd, by signs, and barbarous tones (which in process of time were form'd into significant words) to encourage one another to supply it with fresh combustibles: By this accident, the wild people, who before were afraid of one another, and dwelt asunder, began to find the benefit, and sweetness of *Society*, mutual assistance, and conversation, which they afterwards improv'd, by building *Houses* with those *Trees*, and dwelling nearer together: From these mean and imperfect beginnings they arriv'd in time to be

be Authors of the most polish'd *Arts*, establish'd *Laws*, peopl'd *Nations*, planted *Countries*, and laid the foundation of all that *Order* and *Magnificence* which the succeeding *Ages* have enjoy'd: In a word (and to speak a bold, and noble truth) *Trees*, and *Wood* have twice sav'd the whole world: first by the *Ark*, then by the *Cross*; making full amends for the Evil Fruit of the *Tree* in *Paradise*, by that which was born on the *Tree* in *Golgotha*. But that we may give an account of their *sacred*, and other *Uses* of these venerable *Retirements*, we will next proceed to describe what those places were.

2. Though *Sylva* was the more general *Name*, denoting a large Tract of *Wood*, or *Trees*, the *incidua* and *cœdua*; yet there were several other Titles attributed to greater, or lesser assemblies of them: As when they Planted them for *Pleasure*, and shade only, they had their *Nemora*; and as we our *Parks*, for the preservation of *Game*, and particularly *Venison*, &c. their *Salus*, and *Sylva invia*, secluded for the most part from the rest, &c. But among *Authors*, we meet with nothing more frequent, and indeed more celebrated, than those *Arboreous* amenities and *Plantations* of *Woods*; which they call'd *Luci*; and which though sometimes we confess, were restrain'd to certain peculiar places, yet were they also promiscuously both used, and taken for all that the wide *Forest* comprehends, or can signify. To dismiss a number of *Criticks*, The name *Lucus* is deriv'd by *Quintilian* and others à *minime Lucendo* because of its densitie,

— nulli penetrabilis astro.

Vide Just. Lipsum in Germaniam Tacitum pollice satum.

whence *Apuleius* us'd *Luco subluco*; and the *Poets*, *Sublustre umbra*: Others (on the contrary) have taken it for *Light* in the *Masculine*; because there they kindled *Fires*, by what accident unknown:

— Whether it were

By Lightning sent from Heaven, or else there
The Salvage-men in mutual Wars and Fight,
Had set the Trees on Fire, their Foes to fright.

— See Calli fulmine missa,
Sive quod inter se bellum Sylvæstis gentis
Hostibus intulerant ignem, formidinis ergo, &c.

Lucret. l. 9.

Or whether the *Trees* set Fire on themselves,

When clashing boughs thwarting, each other fire.

Mutua dum inter se rami stirpsque torquentur.

For such Accidents, and even the very heat of the *Sun* alone has kindled wonderful *conflagrations*: or haply (and more probably) to consume their *Sacrifices*, we will not much insist: The *Poets* it seems, speaking of *Juno*, would give it quite another original, and tune it to their Songs invoking *Lucina*, whilst the main and principal difference consisted not so much in the *Name*, as the *Use* and *Dedication*, which was for silent, awful and more solemn *Religion*, to which purpose they were chiefly *manu consecrati*, such as we have been treating of, *intire*, and never violated with the *Axe*: *Fabius* calls them *Sacros ex Vestibate* venerable for their
Age;

Age; and certain it is, they had of very great *Antiquity* been Consecrated to Holy uses, not only by Superstitious Persons to the Gentile Deities and Heroes; but the true God, by the Patriarchs themselves, who *ab initio* (as is presum'd) did frequently retire to such places to serve him 'in, compose their Meditations, and celebrate Sacred Mysteries, Prayers, and Oblations; following the Tradition of the *Gomerites* or Descendants of Noah, who first People'd *Galata* after the universal Deluge. From hence some presume that even the ancient *Druids* had their origin: But that *Abraham* might imitate what the most Religious of that Age had practis'd before him, may not be unlikely; for we read he soon Planted himself and Family at the *Quercetum* of *Mambre*, Gen. 13. where as *Eusebius*, Ecc. Hist. l. 1. c. 18. gives us the account, He spread his Pavilions, erected an Altar, Offer'd and perform'd all the Priestly Rites; and there, to the immortal glory of the Oak, or rather *Arboreous Temple*, he entertained God himself. *Isidor*, St. Hierom, and *Sozomenes* report confidently, that one of the most eminent of those Trees remained till the Reign of the great *Constantine*, who Founded a venerable Chapel under it; and that both the *Christians*, *Jews*, and *Arabs*, held a solemn Anniversary or Station there, and believed that from the very time of Noah it had been a Consecrated place: sure we are, it was about some such assembly of Trees, that God was pleas'd first of all to appear to the Father of the Faithful, when he established the Covenant with him, and more expressly, when removing thence (upon confirming the League with *Abimelech*, Gen. 21. and settling at *Beerseba*) he design'd an express place for God's Divine Service: For there, says the sacred Text, He Planted a Grove, and called upon the Name of the Lord. Such another *trust* we read of (for we must not always restrain it to one single Tree) when the Patriarch came to אֵילֵי מֹרֶכַח *Elon Morech*, ad *Convallem illustrem*: But whether that were the same in which the High-priest reposed the famous Stone, after the Exhortation mention'd *Joshua* 24. 26. we do not contend; under an Oak says the Scripture, and it grew near the Sanctuary, and probably might be that which his Grand-child Consecrated with the Funeral of his beloved *Rebecca*, Gen. 35. For 'tis apparent by the Context, that There, God appeared to him again: So *Grotius* upon the words (*Subter quercum*) *Ilam ipsam* (says he) *cujus mentio*, Gen. 35. 4. in *historia Jacobi & Jude*; and adds, *Is locus in honorem Jacobi diu pro Templo fuit*. That the very spot was long after us'd for a Temple in honour of him.

3. If we would track the Religious esteem of Trees and Woods, yet farther in Holy Writ, we have that glorious Vision of *Moses* in the fiery Thicket, and it is not to abuse or violate the Text, that *Monceus* and others, interpret it to have been an intire Grove, and not a single Bush only, which he saw as burning, yet unconsum'd. Puto ego (says my Author) *rubri vocabulo non quidem rubrum aliquem unicam & solitarium significari, verum rubetum totum, aut potius fruticetum, quomodo de Quercu Mambre pro Querceto*

Querceto toto Docti intelligunt. Now that they Worshipp'd in that Place soon after their coming out of *Agypt*, the following story shews; and the Feast of Tabernacles had some resemblance of Patriarchal Devotion under Trees, though but in temporary Groves and Shades in manner of Booths, yet Celebrated with all the refreshings of the Forest; and from the very Infancy of the World in which Adam was entertain'd in Paradise, and Abraham (as we noted) receiv'd his Divine Guests, not in his Tent, but under a Tree, an Oak, (*Triclinium Angelicum* the Antients Dining-Room) all intelligent persons have embrac'd the solace of shady Arbours, and all devout Persons found how naturally they dispose our Spirit to Religious Contemplations: For this, as some conceive, they much affected to Plant their Trees in Circles, and gave that capacious Form to the first Temples, observ'd not only of old, but even at this day by the Jews, as the most accommodate for their Assemblies; or, as others, because that figure most resembl'd the Universe, and the Heavens: *Templum à Templando* says a knowing Critic, and another, *Templum est nescio quid immane, atque amplum*; such as *Arnobius* speaks of, that had no Roof but Heaven, till that sumptuous Fabric of *Solomon* was confin'd to Jerusalem, and the goodliest Cedars, and most costly Woods were carried thither to form the Columns, and lay the Rafter; and then and not till then, was it so much as *Schism* that I can find, to retire to Groves for their Devotion, or even to Bethel it self.

4. In such Recesses were the ancient Oratories and Profusche built even amongst the Gentiles, as well as the People of God, (nor is it always the less authentical for having been the guise of Nations) hence that of *Philo*, speaking of one who *πρασιναν ὡρεωρυγαν ἰδὼν ποσειδωνος, &c.* had sell'd all the Trees about it; and such a place the Satyrists means, where he asks, *In qua te quæro profuscha?* because it was the Rendezvous also, where poor People us'd to frequent to beg the Alms of devout and Charitable Persons; and it was esteem'd peculiar for any to cut down so much as a stick about them, unless it were to build them, when with the Psalmist, men had honour according to their forwardness of repairing the Houses of God in the Land, upon which account it was lawful to lift up Axes against the goodliest Trees in the Forest; but those zealous days are past,

Now Temples shut, and Groves deserted ly,
All Gold adore, and neglect Picty.

Et nunc desertis cessant sacra sacrae Loci,
Aurum omnis vilita jam pietate colunt.

Proper.

5. They came afterwards indeed to be abus'd to Superstition, and for their opacousness, to abominations, and works of darkness; but what good, or indifferent thing has not been subject to perversion? It is said in the end of *Isaiah*, *Exprobratur Hebreis quod in Opibsonais Idolorum vortu essent in quorum medio stabantur*; but how this is applicable to Groves does not appear so fully; though we find them interdicted, *Dent.* 16. 21. *Judg.* 6. 26. *2 Chron.* 31. 3, &c. and forbidden to be Planted near the Temple; and an impure Grove on Mount Libanus dedicated to Venus, was by

Vide Seldenum de jure Nat. & Gent. lib. L. 2. c. 6. Lil. & Grot. Gynadum de Ais gent. Syn. pag. 17.

Vide Saussum,
Piscat. Gro-
tium.

by an Imperial *Edit* of *Constantine* extirpated; but from the *abuse* of the thing to the *non-use*, the *Consequence* is not always valid, and we may note as to this very particular, that where in divers places of *Holy Writ*, the denunciation against *Groves* is so express, it is frequently to be taken but *catachrestically*, from the *Wooden Image* or *Statue* call'd by that name, as our Learned *Selden* makes out by sundry Instances in his *Syntagma de Diis Syris*.

The Summ of all is, *Paradise* it self was but a kind of *Nemorous Temple* or sacred *Grove*, Planted by *God* himself, and given to *Man*, tanquam primo sacerdoti, the Word is עֵדֶן which properly signifies to Serve or administer *res divinas*, a place Consecrated for sober Discipline, and to Contemplate those *mysterious* and *Sacramental* Trees which they were not to touch with their hands; and in memory of them, I am inclin'd to believe, Holy Men (as we have shew'd in *Abraham* and others) might Plant and cultivate *Groves*, where they traditionally invok'd the *Deity*; and *S. Hierom*, *Chrysostom*, *Cyprian*, *Augustine*, and other *Fathers* of the *Church* greatly magnified these pious advantages; and *Cajetan* tells us, that from *Isaac* to *Jacob* and their Descendants they followed *Abraham* in this Custom: *Solomon* was a great planter of them, and had an house of *Pleasure* or *Lodge* in one of them for *Recess*: In such places were the Monuments of their *Saints*, and the Bones of their *Heroes* deposited; for which *David* celebrated the Humanity of the *Galaadites*, In *Nemora Jaber* as the most sacred and inviolable: In such a place did the *Angel* appear to *Gideon*, and in others *Princes* were *Inaugurated*; so *Abimelec*, *Judic. 9*. And the *Rabbins* add a reason why they were reputed so Venerable; because more remote from Men and Company, more apt to compose the *Soul* and fit it for divine Actions, and sometimes *Apparitions*, for which the first enclosures were attributed to *Groves*, *Mountains*, *Fountains of Water*, and the like solemn objects; as of peculiar Sanctity, and as the old sense of all words denoting Sanctity did import *separateness*, and uncommon propriety: See our Learned *Meade*. For though since the *Devils* intrusion into *Paradise*, even the most holy, and devoted Places were not free from his *Tentations* and ugly *Stratagems*; Yet we find our Blessed *Saviour* did frequently retire into the Wilderness, as *Elijah* and *S. John Baptist* did before him, and divers other Holy men; particularly, the Θεωρηταί, whom *Philo* mentions; a certain Religious *Señ*, who addicting themselves to *Contemplation*, chose the solitary *Recesses* of *Groves* and *Woods*, as of old the *Rechabites*, *Essenes* and other *Institutions*: The reason is obvious, and I shall shew when I come to speak concerning the use of *Gardens* in another *Work* (long since attempted, and now wanting only time to transcribe for the *Press*) how the *Air* of such retired places may be assitant, and influential for the inciting of Penitential expressions and affections; especially where one may have the additional assistances of solitary *Grotts*, murmuring *Streams*, and desolate *Prospects*: I remember that under a *Tree* was the place of that admirable *S. Augustines* solemn *Conversion*, after all his

Philo lib. 1. 212
Sic Stog.

importunate

importunate reluctances: I have often thought of it, and it is a melting passage as himself has recorded it, *Coh. 1. 8. c. 8*. and he gives the reason, *Solitudo enim mihi ad negotium flendi aptior jaggerebatur*. And that indeed such opportunities were successful for *Recollection*, and to the very reformation of some ingenious Spirits from secular Engagements to excellent and mortifying Purposes, we may find in that wonderful relation of *Pontianus's* two Friends, great *Courtiers* of the time, as the same Holy *Father* relates it, previous to his own *Conversion*. And here I cannot omit an observation of the Learned *Dr. Plot* in his (often cited) *Nat. Hist. of Oxfordshire*; taking notice of two eminent *Religious Houses* whose foundations were occasion'd by *Trees*: The first *Oseney Abby*: The second by reason of a certain *Tree* standing in the *Meadows* (where after was built the *Abby*) to which a company of *Pyes* were wont to repair, as oft as *Editha* the wife of *Robert d'Oyly*, came to walk that way to solace her self: for the clamorous *Birds* did so affect her, that consulting with one *Radulphus* (*Canon of S. Fridiswid*) what it might signify, the subtle man advis'd her to build a *Monastery* where that *Tree* stood, as if so directed by the *Pyes* in a miraculous manner: Nor was it long ere the *Lady* procur'd her *Husband* to do it, and to make *Radulphus* (her Confessor) first Prior of it.

Such another Foundation was caus'd by a tripple *Elm*, having three *trunks* issuing from one *Root*: Near such a *Tree* as this was *Sir Thomas White* Lord *Mayor of London*, warn'd by *Dream* to erect a *College* for the education of youth, which he did, namely *St. Johns* in *Oxford*, which with the very *Tree* still flourishes in that famous *University*. But of these enough, and perhaps too much.

6. We shall now in the next place endeavour to shew how this innocent veneration to *Groves* passed from the *People of God* to the *Gentiles*, and by what degrees it degenerated into dangerous Superstitions: For the *Devil* was always *Gods* Ape, and did so ply his *Groves*, *Altars*, and *Sacrifices*, and almost all other Rites belonging to his Worship, that every *Green Tree* was full of his Abominations, and places devoted to his impure Service; *Hi suere* (*says Pliny*, speaking of *Groves*) *quondam Numinum templa, &c.* These were of old the *Temples of the Gods*, and after that simple (but ancient Custom) men at this day Consecrate the fairest and goodliest *Trees* to some *Deity* or other; nor do we more adore our glittering Shrines of *Gold* and *Ivory*, than the *Groves*, in which with a profound and awful silence, we worship them. For in truth the very *Tree* it self was sometimes *Deified*, and that *Celtic* Statue of *Jupiter* no better than a prodigious tall *Oak*, whence 'tis said the *Chaldean Theologues* deriv'd their superstition towards it; and the *Persians* we read, us'd that *Tree* in all their mysterious Rites; so as to some they proceeded to the offering-even of humane *Sacrifices*.

Cypil. Alexand.
in Hist. 4. 13.
Dut. 16. 4.
2 Reg. 16. 4.

Melchior Adamus
1218. Ecclef.
de Sacerdotibus,
c. 234.

Mariana in 2.
Paralip. 28. 4.

Each Tree besprinkled was with humane gore.

Omnis & humanis lustrata cruoribus arbor.
Lucan l. 3.

Procopius tells us plainly that the *Scavii* worshipped *Trees* and whole *Forests* of them: See *Jo. Dabruvius* l. 1. *Hist. Bohem.* and that formerly the *Gandenſes* did the like, *Surius* the *Legendary* 6. Feb. reports in the life of *S. Amadus*: So did the *Vandals*, says *Albert Crantz*; and even those of *Peru*, as I learn from *Acoſta* l. 5. c. 11. But one of the first *Idols* which procur'd particular veneration in them was the *Sidonian Ashtaroth*, who took her name à *Lucis*, as the *Jupiter* ^{videtur p. 8.} amongst the *Rhodians*, the *Nemorensis Diana* or *Ardennæ*, a celebrated *Deity*, of this our *Island*, for her patronage of *Wood* and *Game*.

Divæ potens nemorum, terror sylvestribus Apris, &c.

as *Gildas* an antient *Bard* of ours has it; so soon had Men it seems degenerated into this irrational and stupid Devotion, that Arch-Fanatic *Satan* (who began his pranks in a *Tree*) debauching the Contemplative use of *Groves* and other Solitudes. Nor were the *Heathens* alone in this crime, the *Basiliadians*, and other *Hereticks* even amongst the *Christians*, did consecrate to the *Woods* and the *Trees* their Serpent-footed and barbarous *ABOPEAZAX*, as it is yet to be seen in some of their *mysterious Talismans* and *Pertaptas* which they carried about.

But the *Roman* madness (like that which the *Prophet* derides in the *Jews*) was well pertring'd by *Sedulius* and others, for exploring these *Stocks* to be propitious to them, as we learn in *Cato de R. R.* c. 113. 134. &c. Nor was it long after, when they were generally Consecrated by *Fannus*, that they boldly set up his *Oracles* and *Responses* in these nemorous places: Hence the *Heathen Chapels* had the name of *Pana*, and from their wild and extravagant Religion, the *Professors* of it *Fanatics*; a name well becoming some of our late *Enthusiasts* amongst us; who, when their *Quaking* fits possess them, resemble the giddy motion of *Trees*, whose heads are agitated with every wind of *Doctrines*.

7. Here we may not omit what Learned men have observ'd concerning the Custom of *Prophets* and Persons inspir'd of *old*, to sleep upon the Boughs and branches of *Trees* (I do not mean on the tops of them, as the *Salvages* somewhere do in the *Indies* for fear of *Wild Beasts* in the night time) but on *Matresses* and *Beds* made of their Leaves, ad *Consulendum* to ask advice of *God*. Naturalists tell us, that the *Laurus*, and *Agnus Castus* were *Trees* which greatly compos'd the *Phanſy*, and did facilitate true *Visions*; and that the first was specifically efficacious *περὶ τῶν ἐνδοναζούτων* (as my Authour expresses it) to inspire a *Poetical* fury: Such a *Tradition* there goes of *Rebekah* the Wife of *Isaac*, in imitation of her *Father in Law*: The Instance is recited out of an antient *Ecclesiastical* History by *Abulenſis*; and (what I drive at) that

See S. Hier.
in Trad. Heb.
3 Reg. c. 4.

from hence the *Delphic Tripod*, the *Dodonaean Oracle* in *Epirus*, and others of that nature had their Originals: At this decubation upon *Boughs* the *Satyrists* seems to hint where he introduces the *Gypſes*.

—with fear
The poor the few begs in my Ladies ear,
The Groves high Priests, Heavens true messenger,
Hierusalem's old Laws expounds to her.
Staylton.

Avanum Judea tremens mendicat in aurem
Interpres Ligum Solymarum, & magna Succidos
Arboris, ac summi fida intervancia Celi.

Juv. Sat. 6.

For indeed the *Delphic Oracle* (as *Diodorus* l. 16. tells us) was first made à *Lauri ramis*, of the *Branches* of *Laurel* transferr'd from *Theſſaly*, bended, and arched over in form of a *Bower* or *Summer-house*, a very simple Fabric you may be sure: And *Cardan* I remember in his Book *de Fato*, insists very much on the Dreams of *Trees* for portents and preſages, and that the use of some of them do dispose men to *Visions*.

8. From hence then began *Temples* to be erected and sought to in such Places; and as there was hardly a *Grove* without its *Temple*, so had every *Temple* almost, a *Grove* belonging to it, where they plac'd *Idols*, and *Altars* and *Lights* endow'd with fair *Revenues* which the devotion of Superstitious persons continually augmented; and I remember to have seen something very like this in *Italy*, and other Parts, namely, where the *Images* of the *B. Virgin*, and other *Saints*, have been enshrind in hollow, and umbragious *Trees*, frequented with much veneration, which puts me in mind of what that great Traveller *Pietro della Valla* relates, where he speaks of an extraordinary *Cypress*, yet extant, near the Tomb of *Cyrus*, to which at this day many *Pilgrimages* are made, and speaks of a *Gummy* transudation which it yields, that the *Turks* affirm to turn every *Friday* into drops of *Blood*: The *Tree* is hollow within, adorn'd with many *Lamps*, and fitted for an *Oratory*, and indeed some would derive the name *Lucus* a *Grove*, as more particularly to signify such enormous and cavernous *Trees*, quod ibi lumina accenderentur *Religionis causa*: But our *Author* adds, The *Ethnics* do still repute all great *Trees* to be divine, and the habitation of *Souls* departed: These the *Persians* call *Pir* and *Imâm*. Perhaps such a hollow *Tree* was that *Asylum* of our Poets *Hero*, when he fled from his burning *Troy*.

—an antient cypress near,
Kept by Religious Parents many a year.

—juxtaq; antiqua Cypressus
Religionis Patrum multos servata per annos.
Æn. 2.

For that they were places of Protection, and priviledg'd like *Churches*, and *Altars*, appears out of *Livy* and other good Authority: Thus where they introduce *Romulus* encouraging his new *Colony*,

So soon as e're the *Grove* he had immur'd
Haste thither (says he) here you are secur'd.

—ut saxo Lucum circumdedit alto
Quilibet, hinc, dicit, Confoge, tatus vis.

Such a Sanctuary was the *Aricina*, and Suburban *Diana*, call'd the *Virg. 6. Elog.*
Nemorale Templum, and divers more which we shall reckon up
vide Fab. l. 3.
anon. Semet. c. 1.

*Luci dicitur
non modo colli-
tio phorum,
&c. sed et in
Scaligraphia
p.e. delineatio-
nes Lucorum
in tabella: See
the Annotation
on lib. 17. 8.
colated with
2 Reg. 23. 6.
Critic. Sac. for
they brought the
Grove out of
the Temple,
and burnt it,
which clearly
shows it was
the picture or
Image of the
Grove, and
not the Trees
themselves.

ation. *Lucian* in his *dea Syria* speaks of these Temples and dedications in their Groves among the *Egyptians*: *Lucus in urbe fuit*, &c. and what follows? *Hic Templum* --- and since they could not translate the Grove with the Idol, they *carv'd out something like it, which the superstitious People bought, carried home, and made use of representing those venerable places, in which they had the Images of some feign'd Deity (suppose it *Tellus*, *Baal* or *Priapus*) and such was the *Jupiter* *epithetos* of the *Rhodian*, *Bacchus* of the *Boetians*, *דגון* the *Sidonian Astarte*: And the Women mentioned 2 Reg. 23. 7. who are said to weave hangings, and curtains for the Grove, were no other than makers of *Tentories*, to spread from Tree to Tree, for the more opportune and secret perpetration of those impure Rites and Mysteries, which (without these Coverings) even the opacousness of the places, were not obscure enough to conceal.

9. The Mysteries which the famous *Druids* celebrated in their Woods and Forests, are at large to be found in *Cæsar*, *Pliny*, *Strabo*, *Diodorus*, *Mela*, *Apuleius*, *Ammianus*, *Lucan*, *Avienus*, and innumerable other Writers, where you will see that they chose the Woods and the Groves, not only for all their Religious Exercises, but their Courts of Justice; as the whole Institution and Discipline is recorded by *Cæsar*, l. 6. and as he it seems found it in our Country of *Britain*, from whence it was afterwards translated into *Gallia*: For he attributes the first rise of it to this once happy Island of Groves, and Oaks; and affirms that the ancient *Gauls* travelled hither for their initiation. To this *Tacitus* assents, l. 4. *Annal.* and our most Learned Critics vindicate it both from the *Greeks* and *French*, impertinently challenging it: But the very Name it self, which is purely *Celtic*, does best decide the Controversie: For though *drus* be *Quercus*; yet *Vossius* skilfully proves that the *Druids* were altogether strangers to the *Greeks*; but what comes yet nearer to us, *Drus*, *fides* (as one observes) begetting our now antiquated *Tron*, or *True*, makes our title the stronger: Add to this, that amongst the *Germans* it signified no less than God himself; and we find *Drutin*, or *Trudin* to import *Divine*, or *Faithful* in the *Oldfridian Gospel*, both of them *Sacerdotal* expressions. But that in this Island of ours men should be so extremely devoted to Trees, and especially to the Oak, the strength and defence of all our enjoyments, environ'd as we are by the Seas, and Martial Neighbours, is less to be wonder'd,

Our British *Druids* not with vain intent,
Or without Providence did the Oaks frequent;
That *Albion* did that Tree so much advance
Nor Superstition was, nor ignorance,
Those Priests divining even then, bespoke
The mighty Triumphs of the Royal Oak:
When the Seas Empire with like boundless fame,
Victorious CHARLES the Son of CHARLES shall
(claim.)

Non igitur Dryade nostrata pectore vana,
Nec sine consilio celsa vixit Nomini Quercum;
Non illam Albionis iam tum celebravit honore
Stulta Superstitio, contortive infesta fœci,
Anglicæ ingentes puto prævidisti triumphos
Roboris, impioviq; maris quod maximus olim
CAROLIDES vixit Victor ditioræ reat.

Coult. l. 6. Pl.

as we may find the *Prediction* gloriously followed by our ingenious Poet, where his *Dryad* consigns that Sacred Depositum to this Monarch

Monarch of the Forest, the Oak, than which nothing can be more sublime and rapturous.

10. From those *Sylvan Philosophers* and *Divines* (not to speak much of the *Indian Brachmans* descended of the ancient *Gymnosophists*) 'tis believed that the great *Pythagoras* might Institute his silent *Monasterie*; and we read that *Plato* entertain'd his Auditors amongst his Walks of Trees, which were afterward defac'd by the inhumanity of *Sylla*, when as *Appian* tells us, he cut down those venerable shades to build Forts against *Pyrrus*: And another we find he had, Planted near *Agricines* with his own hands, wherein grew that celebrated *Platanus* under which he introduces his Master *Socrates* discoursing with *Phædon* de *Pulchro*: Such another place was the *Athenian* Cephissia as *Agellinus* describes it; we have already mention'd the stately *Xysta*, with their shades, in cap. 23. *Democritus* also taught in a Grove, as we find in that of *Hippocrates* to *Damagetus*, where there is a particular Tree design'd ad *Otium* *litterarum*; and I remember *Tertullian* calls these places *Studia opaca*: I could here tell you of *Palemone*, *Timon*, *Apollonius*, *Theophrastus*, and many more that erected their Schools in such Colleges of Trees, but I spare my Reader; I shall only note that 'tis reported of *Thucydides*, that he compiled his noble History in the *Scaplan Groves*, as *Pliny* writes; and in that matchless piece de *Oratore*, we shall find the Interlocutors to be often under the *Platanus* in his *Tusculan Villa*, where invited by the freshness and sweetness of the place, *Admonuit* (says one of them) *me hec tua Platanus quæ non minus ad opacandum hunc locum patulis & diffusa ramis, quam illa, cujus umbram secutus est Socrates, quæ mihi videtur non tam ipsæ aquula, quæ describitur, quam Platonis oratione crevisse, &c.* as the Orator brings it in, in the person of one of that meeting.

I confess *Quintilian* seems much to question whether such places be so do not rather perturb, and distract from an Orators Recollection, and the depths of Contemplation: *Non tamen* (says he) *protinus audiendi, qui credunt aptissima in hoc Nemora, sylvasque, quod illa celi libertas, locorumque amenitas, sublimem animum, & beatiorum spirituum parent: Mihi certe jucundus hic magis, quam studiorum hortator videtur esse secessus: Namq; illa ipsa quæ delectant, necesse est avocent ab intentione operis destinati*: He proceeds — *Quare Sylvarum amenitas, & præter labentia flumina, & inspirantes ramis arborum aura, volucrumque cautus & ipsa latè circumspiciendi libertas, ad se trahunt; ut mihi remittere potius voluptas ista videatur cogitationem, quam intendere.* But this is only his singular suffrage, which as conscious of his Error, we soon hear him retract, when he is by and by as loud in its Praises, as the Places in the World the best fitted for the diviner Rhetorique of Poetry: But let us admit another to cast in his Symbol for Groves: *Nemora* (says he) *& Luci, & secretum Tacitus. ipsum, tantam mihi afferunt voluptatem, ut inter præcipuos Carminum fructus numerem, quod nec in strepitu, nec sedente ante hostium litigatore, nec inter sordes & lacrymas rerum componuntur.*

ponuntur : Sed secedit animus loca pura, atque innocentia, fruturque sedibus Sacris.

And indeed the Poets thought of no other Heaven upon Earth, or elsewhere; for when *Anchises* was setting forth the felicity of the other life to his Son, the most lively description he could make of it was to tell him,

— We dwell in shady Groves,

— Lucis habitamus opacis,

and that when *Aeneas* had travell'd far to find those happy Abodes,

They came to Groves, of happy Souls the Rest,
To Ever-green, the dwellings of the Blest.

Devenit locus letos, & amena vireta
Fontanarum Nemorum, Sediſque beatas.

Such a prospect he gives us of his *Elysium*; and therefore wife and great Persons had always these sweet opportunities of Retreat, their *Domus Sylva*, as we read, 2 Reg. 7. 2. which were thence called *Houses of Royal Refreshment*, or as the *Septuagint* gives it *σπηλαια*, not much unlike the *Lodges* in divers of our Noble-mens *Parks*, and *Forest-Walks*; which minds me of his choice in another Poem,

In lofty Towers let Pallas take her rest,
Whilst shady Groves above all things please us best.

— Pallus quas condidit arces,
Hysa colas, nobis placeant ante omnia Sylva.

Ecl. 2.

And for the same reason *Mecenas*

— Chose the broad Oak —

Maluit umbratam Quercum —

and as *Horace* bespeaks them,

Me the cool Woods above the rest advance
Where the rough Satyrs with the light Nymphs dance.

— Me gelidum nemus
Nympharumq; leves cum Satyris Chori,
Secernunt populo —

and *Virgil* again,

Our sweet *Thalia* loves, nor does the corn
To haunt umbragious Groves —

Nistra nec evadit Sylvas habitare Thalia.

or as *thus* expressed by *Petrarch*,

— The Muse her self enjoys
Best in the Woods, verse flies the City noise.

Sylva placet Musis, ubi est inimica Potius.

So true is that of yet a better Poet of our own;

As well might Corn, as Verse in Cities grow,
In vain the thankful Glebe we Plow and Sow,
Against th' unnatural Soil in vain we strive,
Tis not a ground in which these Plants will thrive.

Cowley.

When

When it seems they will bear nothing but *Nettles*, and *Thorns* of *Satyrs*, and as *Juvenal* says, by *Indignation* too; and therefore almost all the Poets, except those who were not able to eat Bread without the Bounty of Great men; that is, without what they could get by flattering them (which was *Homer's* and *Pindar's* case) have not only withdrawn themselves from the Vices and Vanities of the great World, into the innocent felicities of *Gardens*, and *Groves*, and *Retiredness*, but have also commended, and adorned nothing so much in their never-dying Poems. Here then is the true *Parnassus*, *Castalia*, and the *Muses*, and at every call in a Grove of Venerable Oaks, methinks I hear the answer of an hundred old *Druids*, and the *Bards* of our inspired Ancestors.

Innumerable are the Testimonies I might produce in behalf of Groves and Woods out of the Poets, *Virgil*, *Gratius*, *Ovid*, *Horace*, *Claudian*, *Statius*, *Silius*, and others of later times, especially the divine *Petrarch*; were I minded to swell this Charming Subject, beyond the limits of a Chapter: I think only to take notice that Theatrical Representations, such as were those of the *Ionian* call'd *Andria*; the *Scenes* of *Pastorals*, and the like innocent Rural Entertainments were of old adorn'd and trimm'd up à ramis & frondibus, cum racemis & corymbis, and frequently represented in Groves, as the Learned *Scaliger* shews: And here the most beloved of *Apollo* rooted his coy *Mistress*, and the noblest Raptures have been conceiv'd in the Walks and shades of Trees, and Poets have compos'd Verses which have animated men to Heroic and glorious Actions; here *Orators* (as we shew'd) have made their *Panegyrics*, *Historians* grave Relations, and the Profound Philosophers lov'd here to pass their lives in repose and Contemplation, and the frugal Repasts — mollesque sub arbore somni were the natural, and chaste delights of our Fore-fathers.

12. Nor were Groves thus only frequented by the great Scholars, and the great Wits, but by the greatest Statesmen and Politicians also; Thence that of *Cicero* speaking of *Plato*, with *Climachus* and *Megillus*, who were us'd to discourse de reipublicarum institutis, & optimis legibus in the Groves of *Cypress*, and other umbrageous Retreats: Nay they have sometimes been known to Crown their Kings under a goodly Tree, or some venerable Grove, where they had their Stations, and conventions; for to they chose *Abimelec*, see *Tostatus* upon *Judg.* 9. 6. and I read (in *Chronicon Jo. Bromton*) that *Augustine* the Monk (sent hither from the Pope) held a kind of Council under certain Oak in the West of England, and that concerning the great question, namely the right celebration of *Easter*, and the state of the *Anglican-Church*, &c. where also 'tis reported he did a great Miracle. The Athenians were wont to consult of their gravest matters and publick Concernments in Groves: Famous for these Assemblies were the *Cerameian*, and at *Rome* the *Lucus Petilianus*, the *Farentinus*, and others, in which there was held that renowned Parliament after the Defeat of the Gauls by *M. Popilio*: For 'twas supposed that in places so Sacred,

Sacred, they would Faithfully, and Religiously observe what was Concluded amongst them.

In such green Palaces the first Kings reign'd,
Slept in their Shades, and Angels entertain'd:
With such old Counsellors they did advise,
And by frequenting Sacred Groves, grew Wise;
Free from th' impediments of Light and Noyse,
Man thus retir'd, his nobler thoughts employs.

Mr. Waller.

As our excellent Poet has describ'd it: and amongst other weighty matters they treated of *Matches* for their *Children*, and the Young people made *Love* in the cooler Shades, and engrav'd their *Mistress's* Names upon the Bark, *tituli areis literis insculpti*, as *Pliny* speaks of that Ancient *Vatican Ilex*, and *Euripides* in *Hippolyto*, where he shews us how they made the incision, whisper their soft Complaints like that of *Arifanetus*, *Tota de elbe de deipa*, &c. and with that it had but a Soul and a Voice to tell *Cydicpe*, the fair *Cydicpe*, how she was below'd: And doubtless this Character was Antienter than that in *Paper*; let us hear the Amorous Poet leaving his young Couple thus Courting each other.

L. 15. c. 44.
Arist. l. Ep. 10.

Vide Sym-
mach. l. 4.
Ep. 26.

My name on Bark engraven by your fair hand,
Oenone, there, cut by your knife does stand;
And with the Stock my Name alike do's grow,
Be 't so, and my advancing honour show.

Incise servant à te mea nomina sagi,
Et legor, Oenone, falcis notata tuae,
Et quantum trunci, tantum mea nomina crescant,
Crescite, & in titulos surgite vite meae.

Ovid. Ep.

which doubtless he learnt of *Maro* describing the unfortunate *Galus*.

There on the tender bark to carve my Love;
And as they grow, so may my hopes improve.

tenoribus meos incidere amoris
Arboribus: crescant ille, crescat amoris.

Eclog. 10.

and these pretty Monuments of Courtship I find were much us'd on the *Cherry-tree* (the *Wild one* I suppose) which has a very smooth *Rind*, as the witty *Calpurnius*,

Repeat, thy words on Cherry-bark I'll take,
And that red skin my Table-book will make.

Dile age, nam Crassi tua cortice verba notabo.
Et discipula foras vultusq; carmina libro.

I omit *Olympius Nemesianus*, and others, for we have dwelt too long on this trifle, but we will now change the *Scene* as the *Aegyptians* did the mirth of their *Guests*, when they serv'd in a *Scull* to make them more serious. For,

13. Amongst other Uses of *Groves*, I read that some Nations were wont to hang, not Malefactors only, but their departed Friends, and those whom they most esteemed, upon *Trees*, as so much nearer to *Heaven*, and dedicated to *God*; believing it far more honourable, than to be buried in the *Earth*; and that some affected to repose rather in these Woody places *Propertius* seems to bespeak.

The

The Gods forbid my Bones in the high-Road
Should lie, by every wandering vulgar trod;
Thus buried Lovers are to scorn expos'd,
My Tomb in some by-Arbor be inclos'd.

Dili faciant mea ne terrâ locis offa frequenti
Quâ facit affluat tramite vulgus iter;
Post mortem tumuli sic infamantur amantem,
Me tegat arboris devia terra comâ.

The same is affirmed of other *Septentrional* People by *Chr. Cilius de Bello Dithmarico* l. 1. We have already mention'd *Rebekah*, and read of *Kings* themselves that honoured such places with their *Sepulchres*: What else should be the meaning of *1 Chron.* 10. 12. when the valiant men of *Jabesh* interr'd the Bones of *Saul* and *Jonathan* under the *Oke*. Famous was the *Hymethian Cemetery* where *Daiphon* lay; *Ariadnes* Tomb was in the *Amathusian* Grove in *Crete*, now *Candie*: For they believed that the Spirits and *Ghosts* of Men delighted to expatiate, and appear in such solemn places, as the Learned *Grotius* notes from *Theophrastus*, speaking of the *Demons*, upon *Mat.* 8. 20. for which cause *Plato* gave permission, that *Trees* might be Planted over *Graves*, to obumbrate and refresh them.

Our Blessed Saviour chose the *Garden* sometimes for his *Oratory*, and dying, for the place of his *Sepulchre*; and we do avouch for many weighty causes, that there are none more fit to bury our Dead in, than in our *Gardens* and *Groves*, where our *Beds* may be decked with verdant and fragrant *Flowers*, *Trees* and *Perennial* Plants, the most natural and instructive *Hieroglyphics* of our expected *Resurrection* and *Immortality*, besides what they might conduce to the Meditation of the *Living*, and the taking off our Cogitations from dwelling too intently upon more vain and sensual Objects; that *Custom* of *Burying* in *Churches*, and near about them (especially in great and populous *Cities*) being both a *Novel* Presumption, undecent, and very prejudicial to health.

14. To make this *Discourse* the more absolute, we shall add a short recital of the most famous *Groves* which we find Celebrated in *Histories*; and those, besides many already mention'd, were such as being Consecrated both to *Gods*, and *Men*, bore their Names: Amongst these are reckon'd the Sacred to *Minerva*, *Isti*, *Latona*, *Cybele*, *Osiris*, *Æsculapius*, *Diana*, and especially the *Aricinian*, in which there was a goodly *Temple* erected, placed in the midst of an *Island*, with a vast *Lake* about it, a *Mount*, and a *Grotto* adorn'd with *Statues*, and irrigated with plentiful Streams: and this was that renowned Recess of *Nama*, where he so frequently conversed with his *Egeria* as did *Minos* in the *Cave* of *Jupiter*, and by whose pretended Inspirations they gain'd the deceived People, and made them receive what *Laws* he pleas'd to impose upon them. To these we may joyn, the *Groves* of *Vulcan*, *Venus*, and the little youth *Cupid*: *Mars*, *Bellona*, *Bacchus*, *Sylvanus*, the *Muses*, and that near *Helicon* from the same *Numa*, their great *Patron*; and hence had they their Name *Camena*. In this was the noble *Statue* of *Eupheme* Nurse to those *Poetical* Ladies; but so the *Feranian* and even *Mons Parnassus*, were thick shaded with *Trees*. Nor may we omit the more impure *Lupercal* *Groves* Sacred,

M m

Who *Ceres* Groves with steel prophan'd : Where stood
 An old huge *Oak*; even of it tell a Wood.
 Wreaths, Ribands, grateful Tables deckt his boughs
 And sacred Stem; the Dues of powerful Vows.
 Full oft the *Dryades*, with Chaplets crown'd,
 Danç't in the shade; full oft they tript a Round
 About his bole. Five Cubits three times told
 His ample Circuit hardly could infold.
 Whose stature other Trees as far exceeds,
 As other Trees surmount the humble Weeds.
 Yet this his Fury rather did provoke:
 Who bids his Servants fell the Sacred *Oak*.
 And snatches, while they paus'd, an *Ax* from one,
 Thus storming: Not the *Goddeſs* lov'd alone;
 But, though this were the *Goddeſs*, she should down,
 And sweep the Earth with her aspiring Crown.
 As he advanc'd his Arms to strike, the *Oak*
 Both sigh'd and trembl'd at the threatening stroke.
 His Leaves and Acorns, pale together grew,
 And colour-changing-branches sweat cold dew:
 Then wounded by his impious hand, the Blood
 Gush'd from th' incision in a purple flood:
 Much like a mighty *Ox*, that falls before
 The Sacred Altar, sprouting streams of gore.
 On All amazement seiz'd: When one of all
 The Crime deters, nor would his *Ax* let fall.
 Contracting his stern brows; Receive, said he,
 Thy Pieties Reward; and from the Tree
 The stroke converting, lops his Head; then strake
 The *Oak* again; from whence a Voice thus spake:
 A *Nymph* am I, within this Tree inſhrin'd,
 Belov'd of *Ceres*, O prophane of mind,
 Vengeance is near thee: With my parting breath,
 I Prophesie, a Comfort to my Death.
 He still his guilt pursues; who over-throws
 With Cables, and innumerable blows
 The sturdy *Oak*; which nodding long, down ruſh'd,
 And in his lofty fall his fellows cruſh'd.

Sandy.

But a ſad *Revenge* follows it, as the *Poet* will tell you; and one might fill a juſt *Volume* with the *Hiſtories* of *Groves* that were violated by wicked Men, who came to fatal periods; Eſpecially thoſe upon which the *Miffello* grew, than which nothing was reputed more ſacred,

To Miſſello, go *Druid*, they did ſing:Ad viſum *Druidæ*, *Druidæ* cantare ſolabant.for among ſuch *Oaks* they uſually dwelt,—*Nemora*

—*Nemora alta remotis*
Incolitis Lucis —

Lucan.

with whole leaves they adorn'd, and celebrated their religious *Rites*. The *Druids* ſays *Plinie* l. 16. c. 4. (for ſo they call their *Divines*) eſteem nothing more venerable than *Miffello*, and the *Oak* upon which it grows, &c. But of this conſult (beſides the *Author* *Mela*, *Lactantius*, *Eusebius de preparat. Evangel.* and the *Anſularia of Pſendo-Plantius*, *Cambden* and others; whiſt as to that *Excreſcence*, I am told of the diſaſters which happen'd to the two Men who (not long ſince) fell'd a goodly *Oak* near *Crocodon*, upon which a branch of *Miffello* grew, which they ſold: The one loſing ſoon after his *Eye*, the other breaking his *Leg*, as if the *Hamadryads* had reveng'd the indignity.

It is reported that the *Minturenſian Grove* was eſteem'd ſo venerable, that a ſtranger might not be admitted into it; and the great *Xerxes* himſelf when he paſſed through *Achaia*, would not touch a *Grove* which was dedicated to *Jupiter*, Commanding his Army to do it no Violence, and the honours he did to one ſingle (but a goodly) *Platanus* we have already mention'd. The like to this we find when the *Persians* were put to flight by *Panſanias*; though they might have ſav'd their lives by it, as appears in the Story. The ſame reverence made that *Hercules* would not ſo much as taſt the *Waters* of the *Egerian Groves* after he flew *Cacus*, though extremely *thirſty*.

—The *Prieſteſs* ſaid
 (A purple Fillet binding her gray head)
 Stranger, pry not, but quit this ſhady Seat,
 Avant, and whiles thou ſaſely maſt, Retreat,
 To men forbid, and by hard Sanction bound;
 Far better other Springs were by thee found.

Purpureo canas flamma vinſſa comas,
Parce oculis hoſtes, Laticoque abſente verende;
Cede agdam, & tuta limina lingue ſoga,
Interdita viris, mittere lege piatur,
Dis tibi dent alios fontes —

Propert. l. 4.

Nor indeed in ſuch places was it lawful to *Hunt*, unleſs it were to kill for *Sacrifice*, as we read in *Arrianus*; whence 'tis reported by *Strabo*, that in the *Etolian Groves* Sacred to *Diana*, the *Beaſts* were ſo tame, that the very *Wolves* and *Stags* fed together like *Lambs*, and would follow a man licking his hands, and fawning on him. Such a *Grove* was the *Crotonian*, in which *Livy* writes, there was a ſpacious Field like *S. James's Park*, ſtor'd with all ſorts of *Game*. There were many *Foreſts* conſecrated to *Jupiter*, *Juno*, and *Apollo*; eſpecially the famous *Epidaphnes* near the *Syrian Antiach*, which was moſt incomparably pleaſant, adorn'd with *Fountains* and rare *Statues*. There was to be ſeen the *Laurel* which had been his chaſt *Miſtris*, and in the Center of it his *Temple* and *Aſylum*: Here it was *Coſtius* and *Julian* did Sacrifice upon ſeveral occaſions as *Eusebius* relates, but could not with all their impious *Arts* obtain an *Anſwer*; becauſe the holy *Babylas* had been interr'd near that *Oracle*, for which it was reputed ſo venerable, that there remained an expreſs Title in the *Code de Cypreſſis ex Luco Daphnes non excidendis, vel venundandis*, that none ſhould

should either *fell*, or *sell* any of the *Trees* about it, which may serve for another Instance of their *Burying* in such places. The truth is, so exceedingly *Superstitious* they were and tender, that there was almost no meddling with these devoted *Trees*, and even before they did but *conlucare* and prune one of them, they were first to *Sacrifice*, lest they might offend in something ignorantly: But to *Cut* down was *Capital*, and never to be done away with any *Offering* whatsoever; and therefore *Conlucare* in *Authors*, is not (as some pretend) *Succidere*, but to *prune* the Branches only, and yet even *this* gentle confure of superfluities was reputed a kind of Contamination; and hence *Lucus coinquinari dicitur*, unless in the case of *Lightning*, when *Cælo tacti*, a whole Tree might quite be fell'd, as mark'd, by *Heaven* for the Fire. But of this sufficient: We could indeed fill many sheets with the *Catastrophe* of such as maliciously destroy'd *Groves* to feed either their revenge or avarice: See *Plutarch* in *Pericles*, and the saying of *Pompeius*: *Cicero* sharply reproves *G. Gabinius* for his prodigious spoil in *Greece*, and it was of late days held a piece of *Inhumanity* in *Charles* the French King, when he entred the *Prisons* after he had slain their *Leader*, to cut down their *Woods*, a punishment never inflicted by sober Princes, but to prevent *Idolatry* in the Old *Law*; and to shew the heinousness of disloyalty and *Treason* by latter *sanctions*, in which case, and for *Terror*, even a *Traitors* Woods have become *Anathema*, as were easie to instance out of *Histories*.

16. But what shall we say then of our late prodigious *Spoilers*, whose furious devastation of so many goodly *Woods* and *Forests*, have bequeath'd an Infamy on their *Names* and *Memories* not quickly to be forgotten! I mean our unhappy *Usurpers*, and injurious *Sequestrators*; not here to mention the deplorable necessities of a Gallant and Loyal *Gentry*, who for their *Compositions* were (many of them) compell'd to add yet to this *Wast*, by an inhumane and unparallel'd *Tyranny* over them, to preserve the poor remainder of their *Fortunes*, and to find them *Bread*.

Nor was it here they desisted, when, after the Fate of that once beautiful *Grove* under *Greenwich-Castle*, (of late supply'd by his present *Majesty*) the Royal Walk of *Elms* in *S. James's Park*,

That living Gallery of aged Trees,

it was once propos'd to the late *Council of State* (as they call'd it) to be cut down and sold, that with the rest of his *Majesties* Houses already demolished, and mark'd out for Destruction, his *Trees* might likewise undergo the same destiny, and no footsteps of *Monarchy* remain unviolated.

17. It is from hence you may calculate what were the *designs* of those excellent *Reformers*, and the care these great *States-men* took for the preservation of their *Country*, when being *Parties* in the *Booty* themselves, they gave way to so dishonourable and impolitic a *Wast* of that *Material*, which being left intire, or husbanded with discretion, had prov'd the best support and defence of it.

But

But this (say they) was the Effect of *War*, and in the height of our *Contentions*. No, it was a late and cold *deliberation*, and long after all had been subdu'd to them; nor could the most implacable of *Enemies* have express'd a Resolution more barbarous.

We have spoken of the great *Xerxes*, that passing Conquerour through *Achaia*, he would not suffer his *Army* to violate so much as a *Tree* of his *Adversaries*; and have sufficiently observed from the *Antients*, that the *Gods* did never permit them to escape unpunish'd who were injurious to *Groves*. What became of *Agamemnon's* Host after his Spoil of the *Woods* at *Aulis*? *Histories* tell us *Cleomenes* died mad: The *Temelean Genius* became proverbial; and the destructive fact that the enraged *Cæsar* perpetrated on the *Massilian* *Trees*, went not long unrevenge'd, thus related by the *Poet*, and an illustrious *Record* of all we have hitherto produc'd, to assert their Veneration.

Lucus erat longo nunquam violatus ab ævo, &c.

Lucan. l. 3.

A Wood untouch'd of old was growing there
Of thick-set *Trees*, whose boughs spreading and fair;
Meeting, obscured the inclosed *Air*,
And made dark shades exiling *Phæbus* *Rayes*:
There no rude *Fawn*, nor wanton *Sylvan* plays;
No *Nymph* disports, but cruel *Deities*
Claim barbarous *Rites*, and bloody *Sacrifice*:
Each *Tree* desil'd with humane blood; if we
Believe *Traditions* of *Antiquitie*:
No *Bird* dares light upon those hollowed boughs,
No *Beasts* make there their dens; no wind there blows;
No lightning falls: a sad religious awe,
The quiet *Trees* unfir'd by wind do draw.
Black water *Currents* from dark *Fountains* flow:
The *Gods* unpolish'd *Images* do know
No art, but plain, and formless trunks they are,
Their moss and moldiness procures a fear:
The common figures of known *Deities*
Are not so fear'd: not knowing what *God* 'tis,
Makes him more awful: by relation
The shaken *Earths* dark caverns oft did grone:
Fall'n *Ten-trees* often of themselves would rise:
With seeming fire oft flam'd th' unburn'd *Trees*:
And winding dragons the cold *Oaks* embrace,
None give near worship to that baleful place;
The *People* leave it to the *Gods* alone.
When black night reigns, or *Phæbus* gilds the *Noon*,
The *Priest* himself trembles, afraid to spy
In th' awful *Woods* its *Guardian-Deity*.

But now *Erisichthon*-like, and like him in *Punishment*; for his
was Hunger, *Cæsars* Thirst, and thirst of *Humane Blood*, revenge'd
soon after in his *Own*.

The

The *Wood* he bids them fell, not standing far
From all their Work: untoucht in former War,
Among the other bared Hills it stands
Of a thick growth; the Souldiers valiant hands
Trembled to strike, mov'd with the Majestie,
And think the *Ax* from off the Sacred Tree
Rebounding back, would their own bodies wound:
Th' amazement of his Men when *Cæsar* found;
In his bold hand himself an *Hatchet* took,
And first of all assaults a lofty *Oak*,
And having wounded the Religions Tree,
Let no man fear to fell this *'Wood* (quoth he)
The guilt of this Offence let *Cæsar* bear, &c.

May.

and so he did soon after, carrying ('tis thought) the *Maledictions*
of the incensed *Gauls* to his Funeral pile,

For who
The Gods thus injur'd, unreveng'd does go?

Quis enim lesos impune putat
Esse Deos

18. But lest this be charg'd with *Superstition*, because the *Instances* are *Heathen*: It was a more noble and remarkable, as well as recent *Example*, when at the *Siege* of *Breda*, the late Famous General *Spinola* Commanded his *Army* not to violate a *Tree* of a certain *Wood* belonging to the *Prince* of *Orange* there, though a reputed *Traitor*, and in open defiance with his Master. In sum, we read that when *Mithridates* but deliberated about the cutting down of some stately *Trees* which grew near *Patara*, a *City* of *Lycia*, though necessitated to it for the building of Warlike *Engines* with them, being terrifi'd in a *Vision*, he desisted from his purpose. It were to be wish'd these, or the like *Exemplars*, might have wrought some *Effect*, upon the Sacrilegious *Purchasers*, and disloyal *Inlanders* in this Iron-Age amongst us, who have lately made so prodigious a spoyl of those goodly *Forests*, *Woods*, and *Trees* (to gratifie an impious and unworthy *Avarice*) which being once the *Treasure* and *Ornament* of this *Nation*, were doubtless reserved by our more prudent *Ancestors* for the repairs of our floating *Castles*, the *safeguard* and *boast* of this renowned *Island*, when *Necessity*, or some imminent *Peril* should threaten it, or call for their *Affistance*; and not to be devoured by these improvident *Wretches*, who, to their eternal *Reproach*, did (with the *Royal* *Patrimony*) swallow likewise *Gods own Inheritance*; but whose *Sons*, and *Nephews* we have liv'd to see as hastily digorge them again; and with it all the rest of their Holy *Purchaser*, which otherwise they might securely have enjoy'd. But this, in *terrorem* only, and for *Caution* to *Posterity*, whilst we leave the *Guilt*, and those who have done the *Mischief*, to their proper *Scorpions*, and to their *Erisichthonian*-fate, or that of the inexorable *Paræbians*, the vengeance of the *Dryads*, and to their *Tutelar* better *Genius*, if any yet remain, who love the solid *Honour* and *Ornament* of their *Country*: For what could I say less, *Thyogæris*, and

Que tibi fa-
lorum parvas
inflare tuorum
Vasicator —
Vide Nat. l. 8.
Apollon. l. 2.
Argonaut.
Proferunt
quæcum func-
tam quam sibi
Nympha Pægu-
ridæque suis
fecit —

and * *Wood-born* as I am, in behalf of those *Sacred Shades*, which * *At reason* in both grace our *Habitations*, and protect our *Nation*?

Survey: For
to in all ages

from *Trus* have been denominated whole Countries, Regions, Cities and Towns; as *Oparissa* in *Greece*, *Croftis* in *Portus*, *Laventum* in *Italy*, *Synbura* in *Armenia*. Ports, Mountains and eminent Places; as the *Viminalis*, *Asulatum*, &c. The reason is obvious, from the spontaneous growth and abounding of such *Trees* in the respective Soyles.

One thing more I think not impertinent to hint, before I take my leave of this *Chapter*, concerning the *Use* of *Standing Groves*; That in some places of the world, they have no other *Water* to *drink*, than what their *Trees* afford them; not only of their proper *juice* (as we have noted) but from their attraction of the *Evening Moisture*, which impends in the shape of a *Cloud* over them: such a *Tuft* of *Trees* is in the *Island* of *Ferro*, of which consult the learned *Isaac Vossius* upon *Pomponius Mela*, and *Magnenus de Manna*; The same likewise hapning in the *Indies*; so that if their *Woods* were once destroy'd, they might perish for want of *Rains*; upon which account *Barbados* grows every year more torrid, and has not near the *Rain* it formerly enjoy'd, when it was better furnished with *Trees*; and so in *Jamaica* at *Gunaboa*, the *Rains* are observ'd to diminish, as their *Plantations* extend; the like I could tell you of some parts of *England* not far from hence.

19. But I acknowledge how easie it is to be lost in this *Wood*, and that I have hardly power to take off my *Pen* whilst I am on this delightful *Subject*: For what more augst, more charming and useful, than the *culture* and *Preservation* of such goodly *Plantations*,

That shade to our Grand-Children give.

— Seris factura nepotibus umbram.

and afford so sweet, and so agreeable refreshment to our Industrious *Wood-man*,

When He, his wearied Limbs has laid
Under a florid *Platan* Shade.

Cum post labores sub *Platano* cubat
Virentis umbræ —

Clau.

or some other goodly spreading *Trees*, such as we told you stoop the *Legions* of a proud *Conquerour*, and that the wise *Socrates* swore by; That *Passenius Crispus* did *Sacrifice* to, and the honours of his Gods.

20. But whilst we condemn this *Excess* in them; *Christians*, and true *Philosophers* may be instructed to make use of these *Enjoyments* to better purposes, by contemplating the *Miracles* of their *Production* and *structure*: And what *Mortal* is there so perfect an *Atomist*, who will undertake to detect the *thousandth* part, or point of so exile a *Grain*; as that insensible rudiment, or rather *balituous spirit*, which brings forth the lofty *Fir-tree*, and the spreading *Oak*? That *Trees* of so enormous an height and magnitude, as we find some *Elms*, *Planes*, and *Cypresses*; some hard as *Iron*, and solid as *Marble* (for such the *Indies* furnish many) should be swadd'd, and involv'd within so small a dimension (if a

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point

point may be said to have any) without the least luxation, confusion or disorder of Parts, and in so weak and feeble a substance; being at first but a kind of tender *mucilage*, or rather rottenness, which so easily dissolves and corrupts *Substances* so much *harder*, when they are buried in the moist Womb of the *Earth*, whilst *this* tender, and flexible as it is, shall be able in time to displace and rent in sunder whole *Rocks* of stones, and sometimes to cleave them beyond the force of *Iron Wedges*, so as even to remove *Mountains*? For thus no *Weights* are observ'd able to suppress the victorious *Palm*; And thus, our *Tree* (like *Man* whose inverted *Symbol* he is) being sown in *corruption*, rises in glory by little and little ascending into an hard erect *Stem* of comely dimensions, into a solid *Tower* as it were; and that which but lately a single *Ant* would easily have born to his little *Cavern*, now capable of resisting the fury, and braving the Rage of the most impetuous *storms*, *Magni mehercle artificis, clausisse totum in tam exiguo* (to use *Seneca's* expression) & *horror est consideranti*.

Epist. 53.

21. Contemplate we again, What it is which begins this motion or *flame*, causing it first to radiate in the *Earth*, and then to display its Top in the *Air*, so different *Poles* (as I may call them) in such different *Mediums*. How it elects, and then introduces its proper food, and gives *Suck*, as it were, to its yet tender *Infant*, till it have strength and force to prey on, and digest the more solid *Juices* of the *Earth*; for then, and not 'till then, do the *Roots* begin to harden: Consider how it assimilates, separates, and distributes these several supplies; how it concocts, transmutes, augments, produces and nourishes without separation of *Excrements* (at least to us visible) and generates its like, without violation of *Virginity*: By what exquisite percolations, and fermentations it proceeds; for the *Heart*, *Fibers*, *Veins*, *Rind*, *Branches*, *Leaves*, *Blossoms*, *Fruit*; for the strength, Colour, Taste, Odour and other stupendous *Qualities*, and distinct *Faculties*, some of them so repugnant and contrary to others; yet in so uniform, and successive a *Series*, and all this perform'd in the dark, and those secret Recesses of *Nature*. *Quid Florum describam diversitates?* What shall we say of the *Mysterious* forms, variety, and variation of the *Leaves* and *Flowers*, contriv'd with such *Art*, yet without *Art*; some round, others long, *Oval*, *Multangular*, *indented*, *crippled*, *rough*, *smooth* and *polished*, *soft* and *flexible* at every tremulous blast, as if it would drop in a moment, and yet so obstinately adhering, as to be able to contest against the fiercest *Winds*, that prostrate mighty Structures, raising *Hurricanes*, the violence whereof whole *Fleets* and *Countries* do often feel; yet I say, continually making War, and sometimes joining Forces with steeming showers, against the poor *Leaf*, tyed on by a slender *stalk*! there it abides 'till *God* bids it fall: For so the wise *Disposer* of Things has plac'd it, not only for *Ornament*, but use and protection both of *Body* and *Fruit*, from the excessive heat of *Summer*, and colds even of the sharpest *Winters*, and their immediate impressions; as we find it in all such *Places* and *Trees*, as like the blessed and good man,

man, have always *Fruit* upon them, ripe, or preparing to mature; such as the *Pine*, *Fir*, *Arbutus*, *Orange* and most of those which the *Indies* and more *Southern* Tracts plentifully abound in, where *Nature* provides this continual shelter, and clothes them with perennial Garments.

22. Let us again examine with what care the *Seeds*, those little *Souls* of Plants, *Quorum exilitas* (as one says) *vix locum inveniunt* (in which the whole, and compleat *Tree*, though invisible to our dull sense, is yet perfectly and intirely wrapp'd up) are preserv'd from *avolation*, diminution and detriment; expos'd, as they seem to be, to all those accidents of *Weather*, *storms* and *rapacious* Birds, in their spiny, arm'd and compacted *Receptacles*; where they sleep as in their *Caves*, 'till their Prisons let them gently fall into the embraces of the *Earth*, now made pregnant with the *Season*, and ready for another *Burthen*: For at the time of *Tear* the sails not to bring them forth; and with what delight have I beheld this tender, and innumerable Off-spring repulsiating at the Feet of an aged *Tree*! from whence the *Suckers* are drawn, transplanted and educated by humane *Industry*, and forgetting the *stirry* of their *Nature*, become *civiliz'd* to all his *Employments*.

23. Can we look on the prodigious quantity of *Liquor*, which one poor wounded *Birch* will produce in a few hours, and not be astonish'd how some *Trees* should in so short a space, *Weep* more than they *weigh*? and that so dry, so feeble and wretched a *branch* as that which bears the *Grape*, should yield a *Juice* that *Cheers both God and Man*? That the *Pine*, *Fir*, *Larch*, and other *Resinous* *Trees*, Planted in such rude, and uncultivated places, amongst *Rocks* and dry *Humicks*, should transude into *Turpentine*, and pearl out into *Gums*, and precious *Balms*?

24. There are ten Thousand Considerations more, besides that of their *Medicinal* and *Sanative* properties, and the *Mechanical* Uses mention'd in this *Treatise*, which a *Contemplative* Person may derive from the *Groves* and the *Woods*; all of them the Subject of *Wonder*; And though he had only the *Palm* or the *Cocco*, which furnishes a great Part of the *World* with all that even a *Voluptuous* Man can need, or almost desire, it were sufficient to employ his *Meditations* and his *Hands*, as long as he had to live, though his years were as many as the most aged *Oak*: But a *Wife*, and a *Thinking* Man can need none of these *Topics*, in every *Hedge*, and every *Field* they are before him; and yet we do not admire them, because they are Common, and obvious: Thus we fall into the just reproach given by one of the *Philosophers* (introduc'd by Cic. de Nat. the *Oratour*) to those who slighted what they saw every-day, *deor. L. 2.* because they every-day saw them; *Quasi Novitas nos magis quam magnitudo rerum, debeat ad exquirendas causas excitare*: As if Novelty only should be of more force to engage our enquiry into the *Causes* of Things, than the *Worth* and *Magnitude* of the *Things* themselves.

Ronati rapini
S. J.
Horaceum liber
Stendat.
NEMUS.

I conclude this *Chapter*, and whole Discourse with that Incomparable *Poem of Rapinus* (made English by my Son) as Epitomizing all we have laid.

*Me memora, atque omnis nemorum pulcherrimus ordo
Et spacia, umbrarum late fundenda per bortum
Invitant, &c.*

Long rows of Trees and Woods my Pen invite,
With shady Walks a Gardens chief delight:
For nothing without them is pleasant made;
They beauteous to the ruder Country add.
Ye Woods and spreading Groves afford my Mufe
That bough, with which the sacred Poets use
To adorn their brows; that by their pattern led,
I with due Laurels may impute my head.

Metaphors the Oaks their willing tops incline,
Their trembling leaves applauding my design;
With joyful murmurs, and unforced assents,
The Woods of *Gaul* accord me their consent.
Citheron I, and *Metalis* despoile,
Of *grac'h* by the *Arctian* Deities;
I, nor *Molochus*, or *Dodona's* Grove,
Or thee crown'd with black Oaks, *Calydon* love;
Olympe thick with *Cypresses* too I dye;
To *France* alone my *Gaul* I apply,
Where noble Woods in every part abound,
And pleasant Groves commend the fertile ground.

If on thy native soil thou dost prepare
To erect a *Villa*, you must place it there,
Where a free prospect do's its self extend
Into a Garden whence the Sun may lend
His influence from the East; his radiant heat
Should on your house through various windows beat:
But on that side which chiefly open lies
To the North-wind, whence storms and show'rs arise,
There plant a wood: for, without that defence,
Nothing resists the Northern violence.
While with destructive blasts o're cliffs and hills
Rough *Boreas* moves, and all with murmurs fills;
The Oak with shaken boughs on mountains rends,
The Valleys roar, and great *Olympus* bends.
Trees therefore to the winds you must expose,
Whole branches best their powerful rage oppose.

Thus woods defend that part of *Normandy*,
Which spreads its self upon the *British* Sea.
Where trees do all along the Ocean side
Great Villages and Meadows too divide.

But now the means of raising woods I sing;
Though from the parent Oak young hoods may spring,
Or may transplanted flourish, yet I know
No better means than if from seed they grow.
'Tis true this way a longer time will need,
And Oaks but slowly are produc'd by seed:
Yet they with far the happier shades are blest;
For those that rise from Acorns, as they best
With deep-fixt roots beneath the earth descend,
So their large boughs into the air ascend.
Perhaps because, when we young Sets translate,
They lose their virtue, and degenerate,
While Acorns better thrive, since from their birth
They have been more acquainted with the earth.

Thus we to Woods by Acorns Being give
But yet before the ground your Seed receive,
To dig it first employ your Labourer;
Then level it; and, if young shoots appear
Above the ground, sprung from the cloven bud;
If th' earth be planted in the Spring, 'tis good
Those weeds by frequent culture to remove,
Whose roots would to the blossom hurtful prove.
Nor think it labour lost to use the Plow;
By Dung and Tillage all things fertile grow.

There are more ways than one to plant a Grove,
For some do best a rude confusion love:
Some into even squares dispose their trees,
Where every side do's equal bounds possess.
Thus boxes legions with false arms appear
At Chiefs, and represent a face of War,
Which speak to *Sabazia* the *Italians* owe;
The painted frames alternate colours show;
So should the field in space and form agree;
And should in equal bounds divided be.

Whether you plant young Sets, or Acorns sow
Still order keeps; for to they best will grow.
Order to every tree like vigour gives,
And room for the aspiring branches leaves.

When with the leaf your hopes begin to bud,
Banish all wanton Cante from the wood.
The browsing Goat the tender blossom kills;
Let the swift Horse then neigh upon the hills,
And the free Herd still in large Pastures tread;
But not upon the new-sprung branches feed.
For whole defence Inclosures should be made
Of twigs, or water into rills convolv'd.
When ripening time has made your trees dilate,
And the strong roots do deeply penetrate,
All the superfluous branches must be fell'd,
Left the oppressed trunk should chance to yield
Under the weight, and to its spirit lose
In such excrecences; but as for those
Which from the flock you cut, they better thrive,
As if their ruin caus'd them to revive.
And the slow Plant, which scarce advanc'd its head,
Into the air its heavy boughs will spread.

When from the fainted root it springs again,
And can the fury of the North inflame,
On the smooth bark the fleethers should indite
Their rural furies, and there their verses write.

But let no impious axe prophane the woods,
Or violate the sacred shades; the Gods
Themselves inhabit there. Some have beheld
Where drops of blood from wounded Oaks distill'd:
Have seen the trembling boughs with horror shake!
So great a confidence did the Ancients make
To cut down Oaks, that it was held a crime
In that obscure and superstitious time.

For

For *Driapias* Heaven did provoke,
By daring to destroy th' *Amonian* Oak;
And with it it's included *Dryad* too:
Avenging *Ceres* here her faith did show
To the wrong'd Nymph; while *Erifichon* bore
Torments, as great as was his crime before.
Therefore it well might be esteem'd no less
Than Sacrilege, when every dark recess,
The awful silence, and each gloomy shade,
Was sacred by the zealous vulgar made.
When e're they cut down Groves, or spoil'd the Trees,
With gifts the Ancients *Pales* did appease.

Due honours once *Dadana's* Forest had,
When *Oracles* were from the Oaks convey'd.
When woods instructed Prophets to foretell,
And the decrees of Fate in Trees did dwell.

If the aspiring Plant large branches bear,
And Beeches with extended arms appear;
There near his flocks upon the cooler ground
The Swain may lie, and with his Pipe recount
His loves; but let no vice these shades disgrace:
We ought to bear a reverence to the place.
The boughs, th' unbroken silence of a wood,
The leaves themselves demonstrate that some God
Inhabits there, whose flames might be so just.
To burn those groves that had been fir'd by lust.

But through the woods while thus the Rusticks sport,
Whole flocks of Birds will thither too resort;
Whole different notes and murmurs fill the air:
Thither *Id* *Philomela* will repair;
Once to her sister the complaint, but now
She warbles forth her grief on every bough:
Fills all with *Turcs*, their own hard fate;
And makes the melting rocks compassionate.
Disturb not birds which in your trees abide,
By them the will of Heaven is signified:
How oft from hollow Oaks the booding Crow,
The winds and future tempests do's foretell!
Of these the wary *Flouman* should make use;
Hence observations of his own deduce:
And to the changes of the weather tell.
But from your Groves all hurtful birds expel.

When e're you plant, through Oaks your Beech
The hard Male-oak, and lofty *Cerus* choose. (diffuse)
While *Egulus* of the mast-bearing kind,
Chief in *Illicean* Groves we always find.
For it affords a far extending shade;
Of one of these sometimes a wood is made.
They stand unmov'd, though winter do's assail,
Nor more can winds, or rain, or storms prevail.

To their own race they ever are inclin'd,
And love with their allocates to be join'd.
When Fleets are rigg'd, and we to fight prepare,
They yield us Plant and furnish arms for war.
Few to fire, to Plowmen Plows they give,
To other uses we may them derive.
But nothing must the sacred Tree prophane:
Some boughs for Garlands from it may be ta'en
For those whose arms their Country-men preserve,
Such are the honours which the Oaks deserve.

We know not certainly whence first of all
This Plant did borrow its original.
Whether on *Ladon*, or on *Menalus*
It grew, if *Chaonia* did produce

It first, but better from our Mother Earth.
Than modern rumours we may learn their birth:
When *Jupiter* the worlds foundation laid,
Great Earth-born Giants Heaven did invade.
And *Jove* himself, (when these he did subdue,)
His lightning on the fabled brethren threw.
Talus her sons misfortunes do's deplore;
And while the cherishes the yet-warm gore
Of *Rheus* from his monstrous body grows,
A valter trunk, and from his breast arose
A hardened Oak; his shoulders are the frame,
And Oak his high exalted head became.
His hundred arms which lately through the air
Were spread, now to so many boughs repair.
A level bark his now stiff trunk does bid;
And where the Giant stood, a Tree we find.
The earth to *Jove* straight consecrates this Tree,
Appealing to his injur'd Deity;
Then 'twas that man did the first Acorns eat.
Although the honour of this Plant be great,
Both for its shade, and that it sacred is;
Yet when its branches shoot into the Skies,
Let them take heed, while with his brandish'd flame,
The Thunderer hark, shaking *Narces* frame,
Left they be blasted by his pow'rful hand,
While *Tamarisks* secure, and *Mirtles* stand.

The other parts of woods I now must sing;
With Beech, and Oak, let Elm, and Linden spring.
Nor may your Groves the Alder-tree disdain,
Or Maple of a double-colour'd grain.
The fruitful Pine, which on the mountain stands,
And there at large its noble front expands;
Thick-shooting *Hazel*, with the Quick-beam fir,
The Pitch-tree, *Widly*, *Lotus* ever wet;
With well-made trunk here let the *Cornel* grow,
And here *Orian* *Turbinatus* too;
And varlike *Ash*; but Birch and Yew repress;
Let Pines and Firs the highest hills possess:
Brambles and Brakes fill up each vacant space
With hurtful thorns; in your fields Walnuts place,
And hoary Junipers, with Chestnuts good,
With houghs to barrel up *Lynx* blood.

The difference which in planting each is found,
Now learn; since *Elm* with happy verdure's
crown'd:
Since its thick branches do themselves extend,
And a fair bark do's the tall trunk commend;
With rows of Elm your garden or your field
May be adorn'd, and the Sun's heat repell'd.
They best the borders of your wood compose;
Their comely green fill ornamental places.
On a large flat continued ranks may rise,
Whose length will tire our feet, and bound our eyes.
The Gardens thus of *Fountain-leas* are grac'd
By spreading Elms, which on each side are plac'd:
Where endless walks the pleas'd spectator views,
And every turn the verdant Scene renews.

The sage *Corycian* thus his native field
Near *Swift* *Obolian* *Galgus* till'd.
A thousand ways of planting Elms he found;
With them he would sometimes indole his ground:
Off in directer lines to plant he chose;
From one vast tree a numerous offspring rose.
Each young Plant with its old Parent vices,
And from its trunk like branches fill'd arise.
They hurt each other if too near they grow;
Therefore to all a proper space allow.

The

The *Tortian* *Bar* a pleasing Elm-tree chose,
Nor thought it was below him to repose
Enneath its shade, when he from hell return'd,
And for twice-lost *Eurydice* mourn'd.
Hard by cool *Hydra Roshop* does aspire;
The Artist, here, no sooner touch'd his lyre,
But from the shade the spreading boughs drew near,
And the thick trees a sudden wood appear.
Holm, Wych, Cypress, Plane trees thither press:
The proud Elm advances before the rest.
And heaving him his wife, the Vine, advis'd,
That Nuptial Rites were not to be despis'd.
But he the council scorn'd, and by his hate
Of Wedlock, and the Sex, incur'd his fate.

High shooting *Linden* next exacts your care;
With grateful shades to those who raise the air.
When these you plant, you fill the forest bear in mind
Philomen and chaste *Bacis*: These were join'd
In a poor Cottage, by their pious love,
Whose sacred ties did no less lasting prove,
Than life it self. They *Jove* once entertain'd,
And by their kindness so much on him gain'd;
That, being worn by times devouring rage,
He chang'd to trees their weak and useless age.
Though now transform'd, they Male and Female are;
Nor did their change ought of their Sex impair.
Their Timber chiefly is for Turners good;
They soon shoot up, and rise into a wood.

Respect is likewise to the Maple due,
Whose leaves, both in their figure, and their hue,
Are like the *Linden*; but it rudely grows,
And horrid wrinkles all its trunk inclose.

The *Pine*, which spreads it self in ev'ry part,
And from each side large branches does impart,
Adds not the least perfection to your Groves;
Nothing the glory of its leaf removes.
A noble verdure ever it retains,
And o're the humbler plants it proudly reigns.
To the Gods Mother dear; for *Cybele*
Turn'd *Apy* to this Tree.
On one of these vain-glorious *Marjays* died,
And paid his skin to *Pegasus* for his pride.
A way of boring holes in Box he found,
And with his artful fingers chang'd the found.
Glad of himself, and thirly after praise,
On his thrill Box he to the shepherds plays.
With thee, *Apple*, next he will contend,
From thee all charms of musick do defend.
But the bold Piper soon receiv'd his doom;
(*Who strive with Heaven never overcome*.)
A strong made nut their apples fortifies,
Against the storms which threaten from the Skies.
The trees are hardy, as the fruits they bear,
And where rough winds the rugged mountains tear,
These flourish best: the lower vales they dread,
And languish if they have not room to spread.

Hazel dispers'd in any place will live;
In stony grounds wild Ash, and Cornel thrive;
In more abrupt recesses thee we find,
Spontaneously expos'd to rain and wind.

Alder, and Wych, cheerful streams frequent,
And are the Rivers only ornament.
If ancient Fables are to be believ'd,
These were associates heretofore, and liv'd

On fishy Rivers, in a little Boar,
And with their Nets their painful living got.
The Festival approach'd; with one consent
All on the Rites of *Pales* are intent:
While these unmindful of the Holy-day,
Their Nets to dry upon the shore display,
But vengeance soon th' offenders overtook,
Perfishing fill to labour in the Brook.
The angry Goddess fix'd them to the shore,
And for their fault doom'd them to work no more.
Thus to eternal idleness condemn'd;
They felt the weight of Heaven, when contemn'd;
The moisture of those streams by which they stand,
Indues them both with power to expand
Their leaves abroad; leaves, which from guilt look
pale;
In which the never-ceasing Frogs bewail.

Let lofty hills, and each declining ground,
(For there they flourish) with tall Firrs abound.
Layers of these cut from some ancient Grove,
And buried deep in mold, in time will move
Young flocks above the earth, which soon disdain
The Southern blasts, and launch into the Main.

But in more even fields the Ash delights,
Where a good soil the gen'rous Plant invites.
From an Ash, which *Pylus* once did bear,
Divine *Achilles* took that happy Spear,
Which *Hector* kill'd; and in their Champions Fate
Involv'd the ruin of the *Trojan* State.
The Gods were kind to let brave *Hector* dye
By arms, as noble, as his enemy.
Ash, like the stubborn Heroe in his end,
Always resolves rather to break than bend.

Some tears are due to the *Hilades*;
Those many which they shed deserve no less.
Grief'd for their brothers death in Woods they range,
And worn with sorrow into Poplars change.
By which their grief was rend' red more divine,
While all their tears in precious Amber shine.
These, with your other Plants, fill propagate:
'Tis true indeed they are appropriate
To Italy alone, and near the *Po*,
Who gave them their first being, best they grow.

Into your Forests shady Poplars bring,
Which from their feed with equal vigor spring.
Rich Groves of Ebony let *India* show;
Judea Balloms which in *Giltad* flow:
Persia from trees her silken Fleeces comb;
Arabia furnish the *Sabeen* Gum;
Whose odours sweetness to our Temples lend,
And at the Altar with our pray'rs ascend:
Yet I the Groves of *Platan* do more admire,
Which now on Meads, and now on hills aspire.
I not the Wood-nymphs, nor the Ponicke Pine
Esteem, which boasts the splendor of its Line;
Or those which old *Lycen* did adorn;
Or Box on the *Cytorian* mountain born:
Pier *Idean* Vale, or *Erimantian* Grove,
In me no reverence, no honour move;
Since I no trees can find so large, so tall,
As those which fill the shady Woods of *Gaul*.

When from the cloven bud young boughs proceed,
And the Mast-bearing trees their leaves do spread;
The pestilential air it viates
The seasons of the year, and this creates

Whole

Whole swarms of Vermin, which the leaves assail,
And on the woods in num'rous armies fall,
Creatures in different shapes together join'd,
The horrid *Eruc*'s, *Palmer-worm* design'd
With its pestil'ous odours to annoy
Your Plants, and their young offspring to destroy,
Remember then to take these plagues away,
Left they break out in the first show'rs of May.

From planting new and lopping aged trees,
The prudent Ancients bid us never cease:
Thus no decay is in our Forests known;
But in their honour we preserve our own.
Thus in your fields a sudden race will life,
Which with your Nurseries will yield supplies;
That may again some drooping Grove renew:
For trees like men have their successions too.

Their solid bodies worr'd and age impair,
And the wall *Ock-gives* plans to his next heir.
While such designs employ your vacant hours,
As ordering your woods, and shady bow'rs;
Despite not humbler Plants, for they no less,
Than trees, your Gardens beauty do increase.
With what content we look on Myrtle Groves!
On verdant Laurels! There's no man but loves
To find his *Livew*, when *Adonis*, thrive.
To see the lovely *Phylirea* live;
With *Olandir*. Ah! to what delights
Shorn Cypress, and sweet *Gelsimine* invites.

If any Plain be near your Garden found,
With Cypress, or with Horn-beam hedge it round,
Which a thousand Mazes will confound,
And to recesses unperceiv'd retire.
Its branches, like a wall, the paths divide;
Affording a fresh Scene on ev'ry side.
'Tis true, that it was honour'd heretofore;
But order quickly made it valued more.
By its shorn leaves, and those delights which rofe
From the distinguish'd forms in which it grows,
To some cool Arbor, by the ways deceit,
Allur'd, we haste, or some oblique retreat:
Where underneath its umbrage we may meet
With sure defence against the raging heat.

Though Cypressess contiguous well appear,
They better shew if planted not to near:
And since to any shape, with ease, they yield,
What bound's more proper to divide a field,
Repine not *Cyparissus*, then in vain;
For by your change you glory did obtain.

Sylvanus and this Boy with equal fire
Did heretofore a lovely Harp admire;
While in the cooler Pastures once it fed,
An arrow shot at random struck it dead.
But when the youth the dying beast had found,
And knew himself the author of the wound,
With never ceasing sorrow he laments,
And on his breast his grief and anger vents.
Sylvanus mov'd with the poor creatures fate,
Converts his former love to present hate.
And no more pity in his angry words,
Than to himself th' afflicted youth affords.
Wearied of life, and quite oppos'd of wit woe;
Upon the ground his tears in channels flow;
Which having water'd the productive earth,
The Cypress first from thence deriv'd its birth.

With *Sylvan*'s aid; nor was it only meant
To express our sorrow, but for ornament.
Chiefly when growing low your fields they bound,
Or when your Gardens *Avians* are crown'd
With their long rows; sometimes it serves to hide
Some Trench declining on the other side.
Th' unequal branches always keep that green,
Of which its leaves are ne've devolved from.
Though hooch with flowers yet it unmov'd remains,
And by its trial greater glory gains.

Let *Phyllira* on your walls be plac'd,
Either with wyre, or flender twigs made fast.
Is brighter leaf with proudest *Ara* vies,
And lends a pleasing object to our eyes.
Then let it freely on your walls ascend,
And there its native Tapestry extend.

Nor knows he well to make his Garden shine
With all delights, who fragrant *Jasmin*
Neglects to cherish, wherein heretofore
Industrious Bees laid up their precious store.
Useless with poles you fix it to the wall,
Its own deceitful trunk will quickly fall.
These shrubs, like wanton Ives, fill mount high;
But wanting strength on other props rely.
The plant branches which they always bear,
Make them with ease to any thing adhere.
The pleasing odors which their flow'rs expire,
Make the young Nymphs and Marjans them desire,
Those to adorn themselves withal; so that these
To grace the Altars of the Deities.

With foreign *Jasmin* be also form'd
Such as *Iberian* Valleys do afford:
Those which we borrow from the *Portuguesi*;
With them which from the *Indies* o're the Seas
We fetch by ship; in each of which we find
A difference of colour, and of kind.
Though gentle *Zephyrus* propitious proves,
And welcome Spring the rigid cold removes;
Haste not too soon this tender Plant 't expose.
Your Gardens glory, the rash Primrose, shows
Delay is better; since they oft are lost,
By venturing too much into the frost.
The cruel blasts which come from the North wind,
To over-hasty flow'rs are still unkind.
Let others ill create this good in you,
Without deliberation nothing do.
For this will scarce the open air endure,
Till by sufficient warmth it is secure.

No Tree your Gardens, or your Fountains more
Adorns, than what th' *Atlantic* Apples bore.
A deathless beauty crowns its shining leaves,
And to dark Groves its flower lustre gives.
Besides the plenitude of its golden fruit,
Of which the boughs are never destitute;
This gen'rous Shrub in Cafes then dispose,
Made of frong Oak, th' little woods compose;
Which glid'd fruits, and flow'rs which never fade,
A grace to th' Country and your Garden add,
Proud of the treasures Nature has bestow'd.
When snowy flow'rs the slender branches load,
And fraying Nymphs to gather them prepare,
Molest them not; but let your Wife be there;
Your Children, all your Family employ.
That to your house its orders may enjoy.
That with sweet Garlands all may shade their brows;
For in their flow'rs these Plants their vigor lose.

Suffer

Suffer the Nymphs to crop luxuriant trees,
And with their fragrant wreaths themselves to please.
Such soft delights they love; then let them fill
With their fresh-gather'd fruit their bosoms fill.
These Apples *Atlanta* once betray'd:
They, and not Love, o'recame the cruel Maid.
These were the golden Balls which luck'd her pace,
And made her lose the honour of the race.

But these sweet smells, and pleasant shades will cease,
Nor longer be your Gardens happy;
Unless the hostile winter be repell'd,
And those strong blasts sent from the stormy East.
Wherefore to hinder these from doing harm,
You must your trees with walls defensive arm.
To such warm fairs they ever are inclin'd,
Where they avoid the fury of the wind.
These Plants besides that they this cold would shun,
Look for th' *African*, and the *Median* Sun.
A parched *Africa* they flourish more,
Than if they grow by *Syrus* Jcy North.
Left then the frost, or bar'rous North should blast
Your fow'rs, while all the Sky is over-cast
With dusky'n clouds, sheds set apart prepare,
To guard them from the winters piercing air;
Till the kind Sun these tempests do's disperse,
And with his influence cheers the Universe.
Then calmer breezes shall o're storms prevail,
And your fresh Groves shall sweet Perfumes exhale.

These trees are various, and the fruits they bear,
Are different too. The Limons always are
Of oval figure, underneath whole rind
A juce ungrateful to our taste we find.
But though at first our Palates it dispense,
Yet better with our stomach it agrees.
Others less sharp do in *Histraria* spring;
Some, that are mild, from *Portugal* we bring.
Another sort from old *Aranzia* came,
To which that City do's impart its name.
Hard by *Direns* *Araxys* lies
This ancient Town; the Orange hence does rise.
To which in rind and juce the Limons yield,
By each new foyn new tastes are oft infill'd.

Mind not the fables by the *Grecians* told
Of the *Myrsin* Sisters, who of old
On vast Mount *Atlas*, near the *Lilyan* Sea,
With greatest care did cultivate this Tree
Of fierce *Alcidis*, who by force brake in,
And in the spoils of the *Nimian* skin;
And from the Dragon, who securely kept,
Stole, with success, the apples which he kept.
Recurr'd to th' *Austrian*, he fess that hill,
With Orange-trees, which Italy now fill.
But things of greater moment are behind;
For Purple *Oleander* may be joy'n'd
With Oranges, and Myrtles; each of these
Peculiar graces of their own possess.
The Myrtle chiefly, which, if fane fairs true,
From the God's bounty is beginning drew.

'When *Venus* plac'd it in the pleasant shade
Of the *Idean* Vales, about it plac'd
Mild troops of wanton *Cypids*, while the night
Was clear, and *Cynthia* did in trifling light.
This *Citron* above all prefers,
And by transcendent favour made it hers.
With Myrtle, hence, the wedded pair delights
To crown their brows at *Hymeneal* Rites.

Hence *Juno*, who at Marriages presides,
For Nuptial Torches always these provides.
Eriophis, sad *Pracris*, *Phedra* too,
And all those fools, who in *Elysum* woo,
Honour this Plant, and under Myrtle Groves,
If after death they last, recount their loves.

Proud Victors with its boughs themselves adorn,
While round their temples wreaths with it are worn.
Idartus, when the vanquish'd *Sabinus* fled,
Plac'd one of these on his triumphant head.
The trunk is humble, and the top as low,
On which soft leaves and curl'd branches grow.
Its grateful smell, and beauty to cease,
Th' admiring Nymphs on ev'ry part attract.
If too much heat, or fudden cold surprize,
Which are alike the Myrtles enemies,
You must avoid them both, and quickly place
The tender Plant within a wooden Case.
Sheds may protect them, if the cold be great;
Or waiting from the Summers scorching heat,
No impious tool our tenderness allows,
To fell these groves, nor cartel here must browe.

Of *Myrtanders* in great *Vala*'s live,
With *Myrtles* mix'd, and Oranges, and give
Some graces to your *Gardens* extra-ord.
From the confusion of their different dies.

In watry Vales, where pleasant Fountains flow,
Their fragrant berries lovely Bay-trees show.
With leaves for ever green, nor can we guess
By their endowments their extractions less.
The charming Nymph liv'd by clear *Parnus* side;
And might to *Jove* himself have been ally'd,
But that the chole in virtues path to read,
And thought a God unworthy of her bed.
Phabus, whose darts of late successful prov'd
In *Pythons* death, expected to be lov'd.
And had the not withstood blind *Cypids* pow'r,
The fiery floods and heav'n had been her dow'r.
But she by her refusal more obtain'd,
And losing him, immortal honour gain'd,
Cherish'd by thee *Apollo*. Temples wear
The Bays, and ev'ry clam'rous Theater.
The *Capitol* it self, and the proud gate
Of great *Tartary* *Jove* they celebrate.
Into the *Dilpich* Rites, the Stars they dive,
And all the hidden laws of Fate perceive.
They in the field (where death, and danger's found;
Where clashing Arms, and louder Trumpets found)
Incite true courage: hence the Bays, each *Myrtle*,
Th' inspiring *God*, and all good Poets chuse.

Proserpine *Liquidum* grows among the reef,
Whole azure flowers imitate the Reef.
Of an *Exotic* Fowl; they first appear
When the warm Sun, and kinder Spring draws near.
Then the green leaves upon the boughs depend,
And sweet Perfumes into the air ascend.

Pomegranates next their glory vindicate;
Their boughs in gardens pleasing charms create.
Nothing their flaming Purple can exceed,
From the green leaf the golden flow'rs proceed:
Whole splendor, and the various curls they yield,
Add more than usual beauty to the field.
As soon as e're the flowers fade away,
Yet to preserve their lustre from decay,

To them the fruit succeeds, which in a round
Conforms it self, whole top is ever crown'd
In fairs appear, stain'd with the *Tyrian* dye,
A thousand seeds within it order lye.
Thus, when industrious Bees do underake
To raise a waxen Empire, first they make
Rooms for their honey in divided rows;
And last of all, on twigs the Combs dispose.
So ev'ry feed a narrow cell contains,
Made of hard skin, which the frame sustains.
Neither to sharp odors sweet the feds incline
Too much, but in one mixture both conjoin.

From whence this Crown, this Tincture is deriv'd,
We now relate; the Nymph in *Africk* liv'd:
Descended from the old *Namidian* Race,
Beauty enough adorn'd her swartly face;
As much as that tam'd Nation can admit,
Too much, unless her flars had equal'd it.
Mov'd by ambition the desir'd to know
What e're the Priests or Oracles could show
Of things to come, a Kingdom they dispense
In words including an ambiguous sense.

She thought a crown no less had signifi'd,
But in the Priests the did in vain confide.
When *Bacchus* th' Author of the fruitful Vine
From *India* came, her for his Concubine
He takes; and to repair her honour lost,
Presents her with a Crown; by fate thus crost,
The too ambitious Virgin ceas'd to be;
Transmuting her own beauty to this Tree.

Sharp *Palarus*, *Rhamnus*, (which by some
Is White-thorn term'd) your Garden will become.
There heavy *caprifoli*, *Aleca* too,
Th' *Idean* Bulb, and *Hulimus* may grow.
Woody *Acantibus*, *Rufus* there may spring,
With other Shrubs, these skilful Gard'ners bring
Into a thousand forms; but 'tis not fit
To tell their *Species* almost infinite.

From brighter woods the prospect may descend
Into your Garden, there it self extend
In spacious walks, divided equally,
Where the same angles in all parts agree.
In oblique windings others plant their Groves,
For ev'ry man a different figure loves.
Thus the same paths, reflecting still their bound
In various tracts diffuse themselves around.
Whether your walks are straight, or crooked made,
Lix gravel, or green turf be on them laid.
The Nymphs and Marons then in woods may meet,
There walk, and to refresh their weary feet,
Into their Chariots mount, though to the young
Labour and exercise does more belong.

If close-thorn *Phyllirea* you deduce
Into a hedge, for knots the *Carpine* use;
Or into Arbors with a hollow bark,
The plant twigs of soft *Acantibus* make.
With stronger wires the flowing branches bind,
For if the boughs by nothing are confin'd,
The Tonsile Hedge no longer will exceed;
But uncontroll'd beyond its limits fiell.

And since the lawless Graft will oft invade
The neighb'ring walks, repell th' aspiring blade.
Suffer no grafts, or rugged dirt to impair
Your smoothest paths; but to the Gard'ners care
These things we leave; they are his business,
With furring flow'rs, or plucking fruitful trees.
And with the traister to the servants joys,
With him their willing hearts and hands combine:
Some should with rowks tame the yielding ground,
Making it plain, where'ruder clods abound.
Some may fit moisture to your Meadows give,
And to the Plains and Garden may derive
Refreshing dews; let others sweep away
The fallen leaves; mend hedges that decay;
Cut off superfluous boughs; or with a Spade
Find where the Moles their winding nests have made;
Then clothe them up: Another flow'r may fow
In beds prepar'd; on all some task bestow:
That if the Master happens to come down,
To fly the fumes and clamour of the Town;
He in his *Villa* none may idle find;
But fecret joys may please his wearied mind.

And blest is he, who tir'd with his affairs,
Far from all noise, all vain applaude, prepares
To go, and underneath some silent shade,
Which neither cares nor anxious thoughts invade,
Do's, for a while, himself alone possess;
Changing the Town for Rural happiness.
He, when the Sun's hot floods to th' Ocean hast,
E're fable night the world has over-cast,
May from the hills the fields below descry,
At once diversing both his mind and eye.
Or if he please, into the woods may stray,
Listen to th' Birds, which sing at break of day;
Or, when the Cattle come from pasture, hear
The bellowing Oxe, the hollow Valleys tear
With his hoarse voice: Sometimes his fowls invite;
The Fountains too are worthy of his sight.
To ev'ry part he may his care extend,
And these delights all others to transcend,
Thus we the City now no more respect,
Or the vain honours of the Court affect.
But to cool Streams, to aged Groves retire,
And th' unmix'd pleasures of the fields desire.
Making our beds upon the grassie bank,
For which no art, but nature we must thank.
No Marble Pillars, no proud Pavements there,
No Galleries, or fenced Roads appear.
The modest rooms to *India* nothing owe;
Nor Gold, nor Ivory, nor Arras know;
Thus liv'd our Ancestors, when *Satan* reign'd,
While the first Oracles in Oaks remain'd.
A harmless course of life they did pursue;
And sought beyond their hills, their Rivers knew.
None had not yet the Universe ingross'd.
Her Seven Hills few Triumphs then could boast.
Small herds then graz'd in the *Laurentine* Mead;
Nor many more th' *African* Valleys feed.

Of Rural Ornaments, of Woods much more
I could relate, than what I have before;
But what's unfinish'd by my next care requires,
And my tir'd Bark the neighb'ring Port desires.

Resonate montes Laudationem, SYLV A, Et omne Lignum ejus. 14-44-23.

A
Philosophical Discourse
OF
EARTH

Relating to the
*Culture and Improvement of it for Vegetation,
and the Propagation of Plants, &c. as it
was presented to the Royal Society, April
29. 1675.*

By *J. Evelyn Esq; Fellow of the said SOCIETY.*

Ποιήθη τοις κληρικῶσι ἀντὶ τοῦ βασιλέως ἡμετέρου

The Second Edition Improv'd.



L O N D O N,

Printed for *John Martyn*, Printer to the Royal Society.
M DC LXXVIII.

TO THE
RIGHT HONOURABLE
My LORD Viscount
B R O U N C K E R, &c.
President of the
R O T A L S O C I E T Y, &c.

My Lord,

I Have in obedience to your Lordship, and the irresistible Suffrages of that Society over which you preside, resign'd these Papers to be dispos'd of, as you think fit: I hear your Lordships sentence is, they should be made Publick. Why should not a thousand Things of infinitely more value, daily enriching their Collection (and which would better justify the laudable progress of that Assembly) be oftner produc'd, as some of late have been? This, my Lord, would obviate all unkind Objections, and cover the Infirmities of the present Discourse, with things indeed worthy its Institution. But, as I am to obey your Lordships Commands, so both your Lordship and the Society are accountable for publishing the Imperfections of

My Lord,

Your Lordships,
and Their most
obedient Servant,

J. EVELYN.

A
Philosophical Discourse
O F
EARTH.

I AM call'd upon, by Command from your *Lordship*, and the Council, who direct the progress of the *Royal Society* (and as in course it falls) to entertain this *Illustrious Assembly* with something, which being either deduced from, or leading to *Philosophical Experiment*, may be of real use, and suitable to the design of its Institution.

I am highly sensible, as of the honour which is done me, so of the great disadvantages I lye under, for want of abilities to carry me through an undertaking of this importance, and before such acute and learned Judges; but I hope, my obedience to your Commands, and, at least, endeavours, will cover those defects for which I can make no other Apology.

There are few here, I presume, who know not upon how innocent and humble a subject I have long since diverted my thoughts; and therefore, I hope, they will not be displeased, or think it unworthy of their patience, if from their more sublime and noble speculations (and which do often carry them to converse among the brighter Orbs, and Heavenly Bodies) they descend a while, and fix their eyes upon the *Earth*, which I make the present Argument of my Discourse. I had once indeed pitch'd upon a Subject of somewhat a more brisk and lively nature; for what is there in Nature so sluggish and dull as *Earth*? What more spiritual and active than *Vegetation*, and what the *Earth* produces? But *this*, as a Province becoming a more steady hand, and penetrating wit, than mine to cultivate (unless where it transitorily comes in my way to speak of *Salts* and *Ferments*) I leave to those of this learned *Society*, who have already given such admirable Essays of what they will be more able to accomplish upon that useful and curious Theme; and therefore I beg leave, that I may confine myself to my more proper *Element*, the *Earth*, which though the lowest, and most inferior of them all, is yet so subservient, and necessary to *Vegetation*, as without it there could hardly be any such things in Nature.

To begin, I shall in the first place then describe, what I mean by *Earth*; then I shall endeavour to shew you the *several sorts* and kinds of *Earth*; and lastly, how we may best *improve* it to the Uses of the *Husbandman*, the *Forester*, and the *Gardner*, which is indeed

deed of large and profitable extent, though it be but poor and mean in found, compar'd to Mines of Gold and Silver, and other rich *Ores*, which likewise are the Treasures of the Earth, but less innocent and useful.

I intend not here to amuse this noble Audience, or my self, with those nice enquiries, concerning what the real *Form* of that Body, or Substance is, which we call *Earth*, denudated and stripp'd of all *Heterogeneity*, and reduc'd to its principles, as whether it be compos'd of *sandy, central, nitrous*, or other *Salts*, Atoms, and Particles? Whether void of all qualities but dryness, and the like (as they commonly enter into the several definitions of *Philosophers*,) nor of what Figure and Contexture it consists, which cautions it to adhere and combine together, so as to affirm any thing dogmatically thereupon; much less shall I contend, whether it be a *Planet* moving about the *Sun*, or be fixt in the *Center* of the Universe; all which have been the curious researches and velitations of our later *Theorists*: but content my self with that Body or Mass of Gleab, which we both dwell on, and every day cultivate for our necessary subsistence, as it affords us *Corn, Trees, Plants*, and other *Vegetables* of all sorts, useful for humane life, or the innocent refreshments of it.

Kircher. in
mund. subter.

Those who have written *de Arte Combinatoria*, reckon of no fewer than *One hundred seventy nine millions one thousand and sixty different sorts of Earths*; but of all this enormous number, as of all other good things, it seems they do not acquaint us with above eight or nine eminently useful to our purpose; and truly, I can hardly yet arrive at so many. Such as I find naturally and usually to rise from the Pit, I shall here spread before you in their order.

The most beneficial sort of *Mould* or *Earth*, appearing on the surface (for we shall not at present penetrate lower than is necessary for the planting and propagation of *Vegetables*) as it consists of a mixt body, is the *natural* (as I beg leave to call it) *under-turf-Earth*, and the rest which commonly succeeds it, in *strata's*, or layers, till we arrive to the barren, and impenetrable Rock, be it fat or lean, *Loam, Clay, Plastic, Fulgine, or Smectic*; as *Chalk, Marle, Fullers-Earth, Sandy, Gravelly, Stony, Rock, Shelly, Coal, or Mineral*; such as with the Ancients were the *Creta, Argilla, Smectica, Tophacea, Pulla, Alba, Rufa, Columbina, Macra, Cariosa, Rubrica* (I name them promiscuously) to be found in the old *Geoponic* Authors, to whom I refer the Critical.

Most, or all, of these lying (as I affirm'd) in Beds, one upon another, from softer to harder, better to worse, usually determine in *Sand, Gravel, Stone, Rock, or Shell*, which last we frequently meet with in Marls, and Fenny Delves, and sometimes even at the foot of high Mountains, after divers successions of different Moulds.

I begin with what commonly first presents it self under the removed Turf, and which, for having never been violated by the Spade, or received any foreign mixture, we will call the *Virgin-Earth*;

Earth; not that of the *Chymists*, and the Searchers after the *Philosophers Stone*; but as we find it lying about a foot deep, more or less, in our Fields, before you come to any manifest alteration of colour or perfection. This surface-Mold is the best, and sweetest, being enriched with all that the Air, Dews, Showers, and Celestial Influences can contribute to it: For 'tis with good *Earth*, as with excellent *Water*, that's the best, which with least difficulty receives all external qualities; for the fatness of this *Under-turf* Mold, being drawn up by the kindly warmth of the Sun to the superficies, spends but little of its vigour in the Grass and tender verdure which it produces, and easily nourishes without dissipating its virtue, provided no rank Weeds, or predatitious Plants (consuming their Seeds) be suffered to grow and exhaust it; but maintains its natural force, and is therefore of all other uncultivated Molds the most grateful to the Husbandman.

Now as the rest of incumbent, and subjacent *Earths* approach this in virtue, so are they to be valued; and of these there are several kinds, distinguishable by their several constitutions: The best of which is *black, fat*, yet porous, light, and sufficiently tenacious, without any mixture of *Sand* or *Gravel*, rising in pretty gross Clods at the first breaking up of the Plow; but with little labour and exposure falling to pieces, but not crumbling altogether into Dust, which is the defect of a more vicious sort. Of this excellent *black* Mold (fit almost for any thing without much manure) there are three kinds, which differ in hue and goodness.

The next layer in *series* to this, is usually mixt with a sprinkling of Stones, somewhat hard, yet friable, and when well aired and stirred, is not to be rejected; the looseness of it, admitting the refreshment of showers, renders it not improper for Trees, and Plants which require more than ordinary Moisture. Declining from this in perfection, is the *darkish-Gray, or Tawny*, which, the deeper you mine, rises vein'd with yellow, and sometimes reddish, till it end in pale; and if you penetrate yet farther, commonly in Sand, and a gritty stone.

Of a second *Class*, is Mold of an obscure Colour also, more delicate grain, tender, chesum and mellow; clear of stones and grittiness, with an eye of *Loam* and *Sand*, which renders it tight enough, yet moist; of all other the most desirable for *Flowers*, and the *Coronary Garden*.

To this we add, a yet more obscure, and sandy Mold, accompanied with a natural fattiness, and *this*, though rarer, is incomparable for almost any sort of *Fruit Trees*.

A *third* participates of both the former, fattish, yet interspersed with small Flints and Pebbles, not to be altogether neglected.

A *fourth* is totally *sandy*, and that of diverse colours, with sometimes a bottom of *Gravel*, now and then *Rock*, and not seldom *Clay*; and, as the foundations are, so is it more or less retentive of moisture, and tolerable for Culture: But all *Sand* does easily

P P admit

admit of Heat and Moisture, and yet for that not much the better; for either it dismisses, and lets them pass too soon, and so contracts no ligature; or retains it too long; especially where the bottom is of Clay, by which it parches, or chills, producing nothing but Moss, and disposes to *Cancerous* infirmities: But if, as sometimes it fortunes, that the Sand have a surface of more genial mold, and a *fund* of Gravel or loose stone; though it do not long maintain the virtue it receives from Heaven; yet it produces as forward springing, and is parent of sweet Grass, which, though soon burnt up in dry weather, does as soon recover, with the first rain that falls.

Of pure and *sheere-Sand*, there's white, black, bluish, red, yellow, harsher, and milder, and some meer dust in appearance, none of them to be desired alone; but the grey-black, and ash-colour'd, and that which frequently is found in heathy Commons, or of the travelling kind, volatile, and exceeding light, is the most insipid, and worst of all. I do not here speak of the drift and Sea Sands, which is of admirable virtue, and use in mixtures, and to be spread on some lands, because it has been describ'd to accurately already in a just discourse, upon another occasion, by an experienced *Gentleman*, dwelling in the Western parts, where this Manure is perfectly understood, and recommended to more general use.

As of *Sands*, so are there as different sorts of *Clays*, and of as different colours, whereof there is a kind so obstinate and ill-natured, as almost nothing will subdue it, and another so voracious and greedy, as nothing will satiate, without exceeding industry, because it ungratefully devours all that is applied to it, turning it into as arrant *Clay* as it self: Some *Clays* are more pinguid than others; some more slippery; all of them tenacious of Water on the surface, where it stagnates and chills the plant, without penetrating, and in dry seasons coltivate, and hardening with the Sun and Wind, most of them pernicious, and untractable.

The unctuous, and fatter *Clay* frequently lies upon the other, having oftentimes a basis of *Chalk* beneath it; but neither is this worth any thing, 'till it be loosened, and rendred more kind, so as to admit of the air and heavenly influences; In a word, the *blue*, *white*, and *red-clay* (if strong) are all unkind, the stony, and looser sort is yet sometimes tolerable; but the light *Brick-earth* does very well with most *Fruit-trees*.

I had almost forgotten *Marsh-earths*, which though of all other, seemingly, the most churlish, a little after 'tis first dug, and dried (when it soon grows hard, and chaps,) may with labour, and convenient exposure, be brought to an excellent temper; for being the product of rich Slime, and the sediment of Land-Waters, and Inundations, which are usually fat, as also the rotting of Sedge, yea, and frequently of prostrated Trees, formerly growing in, or near them, and in process of time rotted (at least the spray of them) and now converted into mold, becomes very profitable Land: But whether I may reckon this among the natural *Earths*, I do not contend.

Of *Loams*, and *Brick-Earths*, we have several sorts, and some approaching

approaching to *Clay*; others nearer *Marle*, differing also in colour; and if it be not too rude, mingled, in just proportion, with other Mold, an excellent ingredient in all sorts of *Earth*, and so welcome to the Husbandman, and the Gardner especially; as nothing does well without a little dash of it.

Of *Marle* (of a cold, sad nature) seldom have we such quantities in Layers, as we have of the forementioned *Earths*; but we commonly meet with it in places affected to it, and 'tis taken out of Pits, at several depths, and of divers colours, red, white, gray, blue, all of them unctuous, of a slippery nature, and in goodness, as being pure and immixt, it sooner relents after a shower, and when dried again, slackens, and crumbles into dust, without induration, and growing hard again.

Lastly, *Chalk*, which is likewise of several kinds and colours; hard, lofter, fine, courser, slippery and marly, and apt to dissolve with the weather into no unprofitable Manure: Some of them have a Sandish, others a blacker and light surface; and there is a sort which produces sweet Grass, and Aromatick Plants, and some so rank, especially in the Vallies of very high Hills, as to feed not only Sheep, but other Cattel, to great advantage, as we may see in divers places among the *Downs of Sussex*. But it has a peculiar virtue above all this, to improve other Lands, as we shall come to shew.

I forbear to speak particularly of *Fullers Earth*, *Tobacco-Clay*, and the several fictile *Clays*; because they are not so universal, and serviceable to the Plow and Spade; much less of *Terra Lemnia*, *Chia*, *Melita*, *Hetruria* and the rest of the *Sigillate*; nor of the *Bolus*, *Rubrics*, and *Okers*. *Figuline*, *Stiptic*, *Smegmatic*, &c. as they are diversly qualified for several uses, *Medical*, and *Mechanical*; but content my self with those I have already enumerated.

Now besides the Description and Characters we have given of these several *Molds* and *Earths*, as they reside in their several Beds and Couches, there are divers other Indications, by which we may discover their *qualities* and *perfections*; as amongst other, a moist infallible one is, its disposition to melt, and crumble into fine morsels, not turn to Mud and Mortar, upon the descent of gentle showers, how hard soever it seem before, and if in stirring it rise rather in *granules*, than massy Clods.

If excavating a Pit, the Mould, you exhaust, more than fill it again, *Virgil* tells us 'tis good Augury; upon which *Laurembergius* affirms, that at *Wittenberg in Germany*, where the Mould lies so close, as it does not replenish the fols, out of which it has been dug, the *Corn* which is sown in that Country, soon degenerates into *Rye*; and what is still more remarkable, that the *Rye* sown in *Thuringia* (where the *Earth* is less compacted) reverts, after three Crops, to be Wheat again.

My Lord *Bacon* directs to the observation of the *Rain-bow*, where its extremity seems to rest, as pointing to a more roscid and fertile Mold; but this, I conceive, may be very fallacious, it ha-

ving two horns, or bales, which are ever opposite.

But the situation, and declivity of the place is commonly a more certain mark; as what lies under a Southern, or South-East rising-ground; But this is also eligible according to the purposes you would employ it for; some *Plants* affecting hotter, other colder exposures; some delight to dwell on the Hills, others in the Vallies, and closer Seats; and some again are indifferent to either; but generally speaking, most of them chuse the warm, and more benign; and the bottoms are universally fertile, being the recipients of what the showers bring down to them from the Hills and more elevated parts.

Another infallible indication is the nature, and floridness of the *Plants* which officiously it produces; as where *Thisles* spontaneously thrive; where the *Oak* grows tall and spreading; and as the Plant is of *kind*, so to prognostic for what Tillage, Layer, or other use, the ground is proper; *Tyme*, *Straw-berries*, *Betony* &c. direct to Wood; *Camomile*, to a Mould disposed for *Corn*, and I add, to Hortulan furniture; *Burnet*, to Pasture; *Mallows* to Roots, and the like, as my Lord *Verulam* and others observe.

On the contrary, some ground there is so cold, as naturally brings forth nothing but *Gorse*, and *Broom*, *Holly*, *Tew*, *Juniper*, *Joy*, *Box*, &c. which may happily direct us to the planting of *Pine*, *Fir*, the *Phyllireas*, *Spanish Broom*, and other perennial verdures in such places.

Moss, *Rushes*, *Wild-Tansy*, *Sedge*, *Flags*, *Ferne*, *Tarrow*, and where Plants appear wither'd or blasted, shrubby, and curl'd, (which are the effects of immoderate wet, heat and cold interchangeably) are natural auguries of a curst Soil: yet I have observ'd some *Ferny-Grounds* proper enough for *Copp'ce*, and *Forest-trees*. Thus, as by the *Plant* we may conjecture of the *Mould*; so by the *Mould* may we guess at the *Plant*: The more herbaceous and tender, springing from the gentle Bed; the course and rougher Plants, from the rude and churlish: And as some *Earths* appear to be totally barren, and some though not altogether so unfruitful, yet wanting salacity to conceive, vigour to produce, and sensibly excluding all our pains; so there is other, which is perpetually pregnant, and this is likewise a good prognostic.

Upon these, and such like hints, in proposals of transplanting *Spices*, and other exotic rarities, from either *Indies*; the curious should be studious to procure of the natural-Mould in which they grow (and this might be effected to good proportion, by the ballasting of Ships) either to plant, or nourish them in from the *Seed*, till they were of age, and had gained some stability of roots and stem, and become acquainted with the *Genius* of our *Climate*; or for *Essays* of Mixtures, to compose the like.

By the goodness, richness, hungriiness and tincture of the *Water* straining through grounds, and by the weight, and sluggishness of it, compared with the lighter, conjecture also may be made, as in part we have shewed already.

To conclude, there are almost none of our *Senses*, but may of

of right pretend to give their verdict here, and *first*,

By the *Odour* or *Smell*, containing (as my Lord *Verulam* affirms) the juice of *Vegetables* already as it were concocted and prepared; so as after long drowths, upon the first rains, good, and natural Mould will emit a most agreeable scent; and in some places (as *Alonso Barba*, a considerable *Spanish* Author testifies) approaching the most ravishing perfumes; as on the contrary, if the ground be disposed to any *Mineral*, or other ill quality, sending forth *Arsenical*, and very noxious steams; as we find from our *Marshes* and *Fenny* grounds.

By the *Taste*, and that with good reason; all *Earths* abounding more or less in their peculiar *Salts*, as well as *Plants*; some sweet and more grateful; others bitter, mordacious, or astringent; some flat and insipid; all of them to be detected by *percolation* of untainted *Water* through them; though there be who affirm, that the best *Earth*, like the best *Water*, and *Oyl*, has neither Odour, nor Taste.

By the *Touch*, if it be *tenera*, fatty, detersive, and slippery; or more asperous, gritty, porous and friable; likewise, if it stick to the fingers like Bird-lime, or melt, and dissolve on the tongue like Butter: Furthermore, good and excellent *Earth* should be of the same constitution, and not of contrary, as soft and hard; churlish and mild; moist and dry; not too unctuous, nor too lean, but resolvable, and of a just and procreative temper, combining into a light, and easily crumbling Mould; yet consistent, and apt to be wrought and kneaded, such as having a *modicum* of *Loam* naturally rising with it, to entertain the moisture, does neither defile the Fingers, nor cleave much to the Spade, which easily enters it, and such as is usually found under the turf of Pasture-grounds, upon which Cattel have been long fed and foddered. In a word, that is the best *Earth* to all Senses, which is blackish, cuts like Butter, sticks not obstinately, but is short, light, breaking into small Clods; is sweet, will be temper'd without crusting or chapping in dry weather, or (as we say) becoming Mortar in wet.

Lastly, by the *sight*, from all the Instances of *Colour*, and other visible Indications: For the common opinion is (though long since exploded by *Columella*) that all hot, and choleric grounds, are red or brown; cold and dry, blackish; cold and moist, whitish; hot and moist, ruddy; which yet, exhalations from *Minerals*, the heat of the Sun, and other accidents may cause; but generally, they give preeminence to the darker *Grays*; next, to the *Russet*; the clear Tawny is found worse; the light and dark-ash-colour (light also of weight, and resembling *Albes*) good for nothing; but the yellowish-red worst of all. And all these are fit to be known, as contributing to noble and useful *Experiments*, upon due and accurate Comparisons, and enquiries from the several Particles of their Constitutions, Figures, and Modes, as far at least, as we can discover them by the best auxiliaries of *Microscopes*, *Lotions*, *Strainers*, *Calcinations*, *Triturations* and grindings; upon such discovery to judge of their qualities, and by essaying variety of mixtures,

mixtures, and imitating all sorts of *Mold*, *foreign* or *Indigen*, to compound *Earths* as near as may be resembling the natural, for any special or curious use, and be thereby enabled to alter the genius of Grounds as we see occasion.

The consideration of this it was, which gave me the curiosity to fall upon the examining of a Collection I had made of several sorts both of *Earth* and *Soils*, such as I could find about this Territory; whereof some I washed, to find by what would melt, reside, or pass away in the percolation; of what visible Figure they chiefly seemed to consist, armed as I was with an indifferent *Microscope*, of which he pleased to take this brief account.

Gravelly and *Arenous* Earths of several sorts, before they were washed, appeared to be, most of it, rough *Crystals*, of which some very transparent and gemmy; few of them sharp or angular, but roundish; mixed with Atoms and Particles of a mineral hue, which being well dried, and bruised on a hard serpentine Stone, and *Mull'd* of the same, was with little labour, reduced to an impalpable whitish Sand, untransparent, as it happens in the bruising of most, though never so diaphanous bodies, which may be so reduced.

Yellow Sand had the appearance of Amber; bruised, an untransparent paler Sand.

Fat rich Earth, full of black spots, without much discolouring the water (as hardly did any of the Sands at all) being dried, was reduced to a delicate sandy Dust, with very little brightness.

Marsh Earth contained a considerable quantity of Sand, the rest resembled the Fat Earth.

The *Under-pasture mold* had likewise a sandy mixture, and what passed with the water after evaporation, seemed to be an impalpable, and very fine untransparent Sand.

Clay consisted of most exceeding smooth and round Sands, of several opacous colours.

Potters-Earth, of different sorts, ground small, became like Sand, of a yellowish grey, and other colours, exceeding polite and smooth.

A certain *yellowish loamy Earth*, which had been brought to me, with some *Orange-Trees* out of *Italy*, was reduced to a bright soft Sand, appearing more gemmy than in the other *Loams*.

Chalk resembled fine white Flower, and some of it sparkling, especially the harrier sort; but the tender, not.

Fullers-Earth appeared like *Gum tragacanth*, a little wetted, seemingly swelled, yet glittering; but when reduced to a fine dust, a smooth Sand.

Tobacco-Earth, not much bruised, was just like white Starch; washed, and well dried, it resembled the whitest Flower of *Wheat* a little candied: I had not the opportunity of examining the several sorts of *Marles*; and so I proceed to the *Dungs*.

Neats-Dung (the Cattel fed only with Fodder, or little Grass, for 'twas in the Winter I made my observations) appeared to be nothing but straws in the entire substance, and colour little altered,

ed, save what a certain slippery mucilage gave them, sprinkled with a glittering Sand, like Atoms of *Gold*; but upon washing and drying again, the tenacious matter vanished, and the straws appeared separated and clear.

Sheeps-Dung was much like the former, only the spires and blades of a fine short grass conglomerated and rolled up in the Pellets, and the glew about it less viscous, but it passed also away in the lotion.

Swines-Dung had the resemblance of dirty Bees Wax, mingled with straws and husks, which seemed like candied *Eringo*, and some like *Angelica Roots*.

The *Soil of Horses* appeared like great wisps of Hay, and little straws, thin of mucilage, and which being washed, was easily to be discerned by a naked Eye.

Deers-Dung much resembled that of *sheeps*.

Pigeons-Dung consisted of a stiff glutinous matter, easily reducible to dust of a grey colour, with some husky Atoms, after dilution. Lastly,

The *Dung of Poultry*, was so full of Gravel, small stones, and sand, that there appeared little or no other substance, save a very small portion both of white and blackish viscous matter twisted up together; of all the other, the most fetid and ill smelling.

These were all I had time and leisure to examine, I cannot say with all the accurateness they were capable of, but sufficiently to encourage the more curious, and to satisfy my self, that the very finest Earth, and best of Moulds, however to appearance mixt with divers imperfect Bodies may, for ought we know, consist more of *sandy particles*, than of any other whatsoever; at least, if from this *Criterion* we may be allowed to pronounce, what they seem to the Eye, *Sands*, *Crystals*, or *Salts*, call them what you please; the consideration of which being so universally the cause of *Vegetation*, was no small inducement to me, to see, if by examining the several *Earths*, (though but by a cursory inspection) I might possibly detect, what Rudiments of such a *Principle* there were lurking in them; abstractedly taken; nor that I opine *Earth* to be *Salt* alone, and nothing else (though perhaps little more besides *Sulphur*), for so it produces no Vegetable that I know of, without *Water* to dissolve and qualify it for insurrection, and perhaps some other matter fitted to receive the *Seeds*, and keep the Plant steady; which yet for ought I can discern, is also but a finer sort of *Sand*, the clamminess of it being rather something extrinsecal and accidental to it, than any thing natural, and originally constitutive: For, the combination of these several Molds, which gives the signature, slipperiness, and a divers temper, seems rather to be caused by the perpetual and successive rotting of the *Grass*, *Plants*, *Leaves*, *Branches*, *Moss*, and other excrecences growing upon it (than any peculiar or solitary principle apart) which in long tract of time, has amassed together a substance *heterogeneous* to the ruder Particles, which after the dilutions of the superficies (that is of the rich; and fatter Mold) appears to be little other than *Sand*, &c.

or fixed *salts*, of various Figures and Colours; since even the most obdurate and stony *Pebble* beaten, and ground to powder, or by Calcination reduced to an impalpable dust, is as fine both to the Eye, and smooth to the touch, as the most *smectic* Earths and *Marles* themselves; such, at least, as you shall collect from the subsidence (to appearance) of the most Crystal Waters, precipitated by deliquated Oyl of *Tartar*, or the like; and the more they be subdued and broken, the harder they will prove, if (cleared of their *nitrous* parts) they pass the Potters Fire, however they seemed before to be of different constitution: This is evident in Vessels made of *Tabacco-Clay*, or whatever the material be, which has of late been so successfully employed, for the finding out of a composition (if so I may call it) nothing inferior to the hardest *Porceclain*, and almost as beautiful (by a worthy Member of this Society.)

Ac. Hook.

But to return to our superficial Earth, which we call the *Mold*, I affirm it to grow, and increase yearly in depth from the Causes aforesaid; and in some places, to that proportion, as to have raised no inconsiderable Hills and Eminences, by the accidental fall and rotting of Woods and Trees; such as *Birch*, and *Beech*, &c. which are not of a constitution to remain long in the ground (as *Fir*, *Oak*, *Elm*, and some other Timber will do, and grow the harder) without corruption, and relenting into Mold as soft and tender, as what they first were sown or planted in; and of this I am able to give undeniable Instances. I insist not here on the perpetual successions, and generations of *Flints*, and other Stones, in the same places, where they have been sedulously gathered off, by many (not improbably) thought to proceed from *Worm-casts*, hardened by the air, and a certain *lapidescent succus* or spirit, which it meets with: And this, for happening most on *Downs*, very much exposed (yet undisturbed) is the more probable; as, on the other side, it establishes our conjecture of the purest Molds being capable of such a change; that which is thus cast up by the Worms, being so exceedingly elaborated and refined: Therefore let no man be over-confident, that because some *Earths* are soft, fat, and slippery, they may not possibly consist of *sands* (of which there are so many kinds,) since 'tis evident, that even all fossile Bodies, which can be reduced and brought to sands, may by contrition of the Particles be rendered so minute, as to emulate the finest *Earths* we have enumerated; the compactedness, and accidental mixtures resulting (as we affirm) from things extrinsecal, not excluding exhalations, passage of liquors and several juices to them, or conveyed by subterraneous steams and influences, be the Stones or Rock *Glareous*, *Metallic*, *Tefaceous*, *Salts*, or any other Concretes whatsoever. And what, if we should indeed suspect all *Earth* to be arant *Salts*, nay *Glass*, and that *Glass*, how hard soever, the off-spring and child of *water*, the most fluid, crystalline, sincere and void of all other qualities? 'tis not impossible, I think, but by the different texture of its parts, even that liquid *Element* may be brought to the consistence of a most different body to what

it

it appears: We know, that *Water* (besides that it was the first immense body which invested the *Chaos*) was by some thought to be Gen. i. the *Mother of Earth*, (nay the *principia soluta* of all mixts whatsoever,) and that the bottom of the Sea was made by a perpetual *Hypostasis* or turbidness, which precipitated from every part of it to the Center. I do not stand to justify these speculations, but to illustrate what I am about; namely, that *Water* is apt enough to be condensed and made hard; and crude *Mercury*, and running metal, *Crystals*, *Gems*, and *Pearls*, do more resemble it, than that dirty and opaque body, which we usually denominate *Earth*: Besides we find, how divers *Waters*, not only indurate, and petrify other substances, but grow into *Stones*, and leave a rocky *Callus* where they drop and continually pass, and that all sands and stones are not diaphanous; therefore that is no evincion, but that they might once have been fluid, since their opacity may be adventitious and proceed from sundry accidents; so as granting this *Hypothesis*, we are less to wonder, that this matter is above all other so disposed to *Vegetation*, and apt to produce *Plants*: indued with Colour, Weight, Taste, Odour, and with sundry medical and other virtues, as I think that excellent Philosopher Mr. Boyle (the great ornament of this Society) does somewhere make out from the various *Percolations*, *Concoctions*, and *Circulations* of that fruitful *Menstrue*: And if that be true, that there is but one *Catholic*, *homogeneous*, fluid matter, (diversified only by *shape*, *size*, *motion*, *repose*, and various texture of the minute Particles it consists of; and from which affections of matter, the divers qualities result of particular bodies;) what may not mixture, and an attent inspection into the anatomical parts of the vegetable family in time produce, for our composing of all sorts of Molds and Soils almost imaginable, which is the drift of my present Discourse? And why might not *Solomon* by this means have really had all kinds of *Plants* in his incomparable Gardens? even *Ebony*, *Cloves*, *Cinnamon*, and from the *Cedar* to the *Shrub*, such as grew only in the remotest regions, furnished (as he doubtless was) with so extraordinary an insight into all natural things, and powers, for the composing of Earths, and assigning them their proper mixtures and ferments. I do not here enquire, whether there be not a *Panferme* universally diffused, individuated, and specified in their several *Matrixes*, and receptacles *pro ratione mixti* (as they speak) but I think there might very unexpected *Phenomenas* be brought to light, in vegetable productions, did men seriously apply themselves to make such possible trials, as is in the power of Art to effect; and how far *Soils* may be dissembled, and the *Air*, and *Water* tempered, (at least for some curiosities, which may give light to more useful things) I do not conclude; but I should expect very rare, and considerable things from an attentive and diligent Endeavour. To this end, the raising of artificial *Dews* and *Mists*, impregnated with several qualities, for the more natural refreshment of *Exotic* Plants, were, it may be, no hard matter to effect, no more than were the modification of the *Air* abroad, as well as in our more confined

fin'd Reserves, where we set them in for *Hyemation*, and during the most rigorous Colds. As for mixtures of *Earths*; Plants we know, are nourish'd by things of like affinity with the constitution of the Soil which produces them; and therefore 'tis of singular importance, to be well read in the *Alphabet of Earths and Composts*: For, as we have said, Plants affect the *Marsh, Bog, Mountain, Vally, Sand, Gravel, fat and lean* Mold, according to their tempers; and for want of skill in this, the same Plant not only languishes and starves, but some we find to grow so luxuriate, as to change their very shapes, colours, leaves, roots, and other parts, and to grow almost out of knowledge of the skillfullest *Botanists*; not here to speak of what alterations do accrue from transplanting and irrigations alone. I mention this, to incite the curious to essay artificial Compositions, in defect of the natural Soil; to make new *confusions* of Earths and Molds for the entertaining of the most generous and profitable Plants, as well as curious; especially, if as I hinted, we could skill to modifie also the *Air* about them, and make the remedy as well *regional* as *topical*; and why not for other Fruits (Strangers yet amongst us) as for *Oranges, Lemons, Pomegranats, Figs*, and other precious Trees, which of late are become almost indenizon'd amongst us, and grow every generation more reconcileable to the Climate?

Here we might enlarge upon the several enquiries formerly suggested: As, how far *Principles* might be multiply'd, and differenced by alteration and condensation? Whether *Earth*, stript of all *heterogeneity*, and ununiform particles, retain only weight, and an insipid siccity? And whether it produce, or afford any thing more than *embracement* to the first rudiments of *Plants*, protection to the roots, and stability to the stem; unprolific, as they say, 'till married to something of a more masculine virtue which irradiates her womb; but otherways, nourishing only from what it attracts, without any *active* or *material* contribution: These indeed, with many other *queries*, do appositely come in here; but it would perhaps render this Discourse more prolix, than useful, to enter upon them in *detaille*; nor is it for me to undertake speculations of so abstruse a nature, without unpardonable ostentation; and therefore having only offered something towards the discovery of the great varieties, and choice of *Earths*, (such as we *Gardeners* and *Rustics* for the most part meet with in our Grounds,) my next endeavour shall be to shew, how we may improve the best, and prescribe remedy to the worst, by *labour* and stirring only, which being the least artificial, approach the nearest to Nature.

At the first breaking up of your Ground therefore, let there be a pretty deep Trench or Furrow made throughout, of competent depth (as the manner is of experienced *Gardeners*), the Turf being first pared off, and laid by it self, with the first Mold lying under it, and that of the next in succession, that so they may both participate of the Air, Showers, and Influences, to which they are expos'd; and this is to be done in severals, as deep as you think fit, that is, so far, as you find the *Earth* well natur'd; or you may fling

fling it up in several small mounds or lumps, suffering the Frosts and Snows of a Winter or two (according as the nature of it seems to require) pass upon them, beginning your work about the commencement of *Autumn*, before the Mold becomes too ponderous and sluggish; though some there are, who chuse an earlier season, and to open their Ground when the *Sun* approaches, not when he retires: But certainly, to have the whole *Winter* before us, does best temper, and prepare it for those impregnating agents.

In separating the surface-mold from the deeper, whether you make a Trench, or dig holes to plant your Trees in, be it for *Standards, Espaliers, or Shrubs*; the longer you expose it, and leave the receptacles open (were it for two whole *Winters*) it soon would recompense your expectation; and especially, if when you come to Plant, you dispose of the best, and fattest Earth at the bottom; which if it be of sweet, and ventilated *Mud of Ponds, or High-way-dust*, were preferable to all the artificial *Composts* you can devise: In defect of this, (where it cannot be had in quantity) cast in the upper *Turf* (if not already consumed) the *Sod* downwards, with the next adhering Mold for half a foot in thickness; on this, a layer of well-matur'd *Dung*; then as much of the *Earth* which was last flung out, mixing them very well together: Repeat this process for *kinds, mixture, and thickness*, till your *trenches and holes* be fill'd four or five Inches above the level, or area of the Ground, to which it will quickly subside upon the first refreshings, and a very gentle treading to establish the Tree: *Fruit* planted in such Mold, you will find to prosper infinitely better, than where young Trees are clapt in at adventure, in new-broken-up Earth, which is always cold and sluggish, and ill complexion'd; nor will they require (as else they do) to be supplied every foot with fresh Soil, before they be able to put forth lusty and spreading roots; but which it is impossible to convey to them, so as to affect the underparts, by excavating the ground, and undermining the Trees (after once they arrive to any stature) without much trouble and inconvenience, and the manifest retarding of their progress.

If you will plant in *pits and holes*, and not give your ground an universal *Trenching* (which I prefer,) make them the larger, (*five foot* at the least square) but not above half a *yard* or two *foot* deep, according to the nature of the Tree. In dressing the *Roots*, be as sparing as possible of the *Fibers*, small and tender strings (which are as the *Emulgent Veins* which insuffle and convey the nourishment to the whole Tree;) and such of the stronger; and more confirmed parts which you trim, cut sloping, so as the wound may best apply to the Earth. The *Heads*, or Top I advise you to let alone, 'till after the most penetrating colds be past, and then, about *February*, to take them off, and shape them as you please, and as the skillful *Gardeners* can direct you. Now the *Earth* in which you thus plant your *Fruit-trees*, will require *four annual stirrings*; namely, at the approach of *March*; a Spade-bit deep, covering it with some *Mungy* stuff, heaps of *Graffot Weeds* to protect it from the parching *Sun*: In *May* following, after a gentle rain, stir again,

gain, but not deeper than to molest the subnaſcent *Weeds*. Thirdly, in the Month of *July*, and laſtly *October*, after the ſame method you are taught in *March*.

This, for *ſtandards* planted out for good and all: The *Nurſery* requires a buſier proceſs, as 'tis excellently deſcrib'd by Eſq; *Coſton* in that late incomparable *Manual*, publiſh'd by that worthy Perſon. Briefly thus, three weeks before *Midſummer*, lay ſome green *Fern* about the Ranks, after the ground is labour'd, to defend it from the heats; in which work care muſt be had not to offend the tender *Roots*; therefore you ſhall ſtir it deeper in the middle of the lines or interſtices, and when *Winter* comes, bury the *Ferns* in the place, by making little trenches, or rather taking away ſome of the Earth you ſhoulder'd up, when the ſtocks were firſt drawn out of the *Seminarie*, and planted in thoſe rows; yet ſo, as to leave it ſomewhat higher than the *Area*, to ſecure them from the froſts. In *March* following ſtir your *Nurſery* again, chopping, and mincing in the *Ferns*, and mingling it with the looſen'd *Mold* which you took from the *Imper* when you firſt apply'd the *Fern*: Then back them up again as before: Repeat this *three* or *four* years ſucceſſively, 'till your *Stocks* are fit to Graſs on. An *Orchard* thus planted, *Spring* and *Autumnal* ſtirrings of the *Mold* about them, is of incredible advantage; and even during the hotteſt Summer-Months carefully to abate the *Weeds* (but not to dig above a quarter of a *Spit*-deep, for fear of expoſing them to the *Sun*, unleſs it be after plentiful ſhowers) is very neceſſary.

There are, I confeſs, who ſanſie that this long expoſure of *Earth* before it be employed for a Crop, cauſes it to exhale, and ſpend the virtue which it ſhould retain; but, provided nothing be ſuffered to grow on it whiſt it lies thus rough and *fallow*, there's no danger of that; there being in truth, no compoſt, or *ſtatation* whatſoever comparable to this continual motion, *repaſtination*, and turning of the *Mold* with the Spade; the pared-off Turf (which is the very fat, and *effluſcence* of the *Earth*) and even *Weeds* with their vegetable *ſalts*, ſo collected into heaps, and expoſed, being reduced, and falling into natural, ſweet, and excellent *Mold*. I ſay, this is a marvellous advantage, and does in greater meaſure fertilize the ground alone, without any other addition: For the *Earth*, which was formerly dull and unactive, or perhaps producing but one kind of Plant, will by this culture diſpoſe it ſelf to bring forth variety, as it lies in depths, be it never ſo profound, cold and crude, the nature of the Plant always following the genius of the Soil; but indeed requiring time, according to the depth from whence you fetch it, to purge and prepare it ſelf, and render it fit for conception, evaporating the malignant *Halitus* and impurities of the impriſoned air, laxing the parts, and giving eaſie deliverance to its off-ſpring.

I do not diſpute, whether all Plants have their *primigenial Seeds*, and that nothing emerges ſpontaneouſly, and at adventure; but, that theſe would riſe freely, in all places, if impediments were removed (of which ſomething has already been ſpoken;) and to ſhew,

ſhew, how pregnant moſt *Earths* would become, were theſe indiſpoſitions cured, and that thoſe ſeminal rudiments, wherever latent, were free to move, and exert their virtue, by taking-off theſe Chains and Weights which fetter and deprels them.

It is verily almoſt a miracle to ſee, how the ſame Land, without any other Manure or Culture, will bring forth, and even luxuriate; and that the bare raking and *combing* only of a bed of *Earth*, now one way, then another, as to the *regions* of Heaven, and *polar* *Aspects*, may diverſifie the annual production, which is a ſecret worthy to be conſidered: I am only to caution our labourer as to the preſent work, that he do not ſtir the ground in over-wet, and ſlabby weather; that the *Sulcus* or Trench, be made to run from *North* to *South*, and that, if there be occaſion for opening of a freſh piece of *Earth*, for preſent uſe, he dig not above one *Spit*-deep which will be ſufficient to cover the roots of any plantable Fruit or other Tree; otherwiſe, not to diſturb it again, 'till the *March* following; when, if he pleaſe, and that the ground ſeem to require an haltier maturation, there may be a Crop of *Beans*, *Peaſe*, or *Turneps* ſown upon it, which will mellow it exceedingly, and deſtroy the noxious *Weeds*; after which, with a ſlight *repaſtination*, one may plant, or ſow any thing in it freely; eſpecially *Roots*, which will thrive bravely; and ſo will *Trees*, provided you plant them not too deep, but endeavour to make them ſpread, and take in the ſucculent virtue of the upper *Mold*; and therefore too deep trenching is not always profitable, unleſs it be for *Eſculent* *Roots*, ſuch as *Carrots*, *Parſneps*, *Beets*, and the like; ſince *Trees*, eſpecially *Fruit*, would be tempted even by *bait*, to run ſhallow; ſuch as penetrate deep, commonly ſpending more in Wood and Leaves, than in the burden for which we plant them.

There is only this caution due, that you never plant your *Roots* where the ſtiff, and churliſh ground is likely to be within reach of them; for though it be neither neceſſary nor convenient, they ſhould penetrate deep, it is yet of high importance, they ſhould dilate and ſpread, which they will never do in obſtinate and inhospitable land (but revert back towards the milder, and better natured *Mold*,) which crumples the roots, and perverts their poſture to their exceeding damage. And to this infirmity our rare *Exotic* Plants, and *Shrubs* are moſt obnoxious, confined as they are to their *Wooden* *Ceſes*, and *Teſtaceous* *Prifons*, and therefore require to be frequently trimm'd, and ſupplied with freſh, and ſucculent *Mould* to entertain the *Fibers*, which elſe you will find to mat in unexplicable intanglements, and adhere to the ſides of the Veſſel, where they dry or corrupt.

Having ſaid thus much of the *Natural*, I ſhould now come to *Artificial* helps, by application of *Dungs*, and *Compoſts*; and indeed, *ſiude ut magnum ſterquilinum habes*, was old, and good advice; but for that there be, who affirm any Culture of the *Earth* preferable to *Dung*, even things ſo ſlight as the haume of *Peas* and *Lupines*, or any other *Puſe* (for when I ſpeak of *Dungs*,

I mean those excrementitious and fordid materials which we commonly heap up and lay upon our Grounds.) I beg your patience to suspend a while my stirring that less pleasant mixture, and, 'till it be well air'd and fit for use, proceed a little farther on our former subject, and try what aid we may yet expect from more kind and benign means, before we come to the gross and violent. For, besides that such *compost* (at least so prepared as it ought to be) is not every where, nor always to be had in quantities; to confide in *Dungs* and *Ordure*, is not so safe, and of that importance to our Husbandman, as some are made believe; since if we shall look back into the best experience of elder days, we shall find, they had very little, or no use at all of *stercoration*. I know some there be, who attribute this neglect to the natural fertility of the Country, that 'tis the busie nurse of *vermine*, and nauseous accidents; but waving these, (without intending to desert the aid of Soil in place and time,) I proceed with what I call more natural helps; namely, as we have shewed, by *opening, stirring, and ventilating* the *Earth*, and sometimes its contrary, by *coverture, shade, rest*, and forbearance for a season, as we daily see it practised in our worn-out and exhausted lay-fields, which enjoy their *Sabbaths*. 'Tis certain, that for our *Gardens* of Pleasure, the fairest beauties of the *Parterre*, require rather a fine, quick, friable, and well-wrought Mold, than a rank or richly dunged: and even all *Fruit-Trees* affect not to stand upon artificial and loose *Composts*, but in naturally rich, and sweet mold, within the scent and neighbour-hood of well-consum'd *soil* for the next *layer* under, and above; so as the virtue thereof may be derived to it through a *colature* of natural Earth; those forcing mixtures being more proper for *Annuals*, and *Exotic* toys, which having but little time to live, refuse no assistances, whilst Trees of longer durance, care not much for accelerations.

Dr. Bail.

I shall here then begin with an *experiment* I have been taught by a learned Person of this illustrious Body, from whom I have long since received the choicest documents upon *this* and many curious subjects. And first, That amongst the mechanical aids, (wherein *stercoration* has no hand) that of pulverizing the *Earth* by concussion, and breaking it with Plow or Spade, is of admirable effect to dispose it for the reception of all the natural impregnations we have been discoursing upon, as constant and undeniable, I think will be evinced. For the *Earth*, especially if fresh, has a certain *magnetism* in it, by which it attracts the *Salt*, power, or virtue (call it either,) which gives it life, and is the *Logic* of all the labour and stir we keep about it, to sustain us; all *dingings*, and other fordid temperings, being but the *vicars* succedaneous to this improvement, which of all other makes its return of Fruit, or whatsoever else it bears, without imparting any of those ill and pernicious qualities, which we sensibly discover from forced grounds; and that not only in the *Plants* which they produce, but in the very *Animals* which they feed and nourish.

I know, *Laurembergius* (somewhere) denies this, and that *Animals*

mals in preparing *Chyle*, transmute, alter, and infuse what is only their proper aliment; rejecting all that is superfluous; but as our Early *Asparagus, Cauliflowers*, and divers roots, manifestly refuse it, so does the taste of the flesh, and milk of *Cattel*, and especially *Fowls*, that feed on the wild Garlick, Fenny-grass, and other rank and putrid things; not here to insist on their sweet, and delicate relish upon their change of Food, or more odoriferous pasture: But to the experiment.

Take of the most barren *Earth* you can find, drain'd, if you please, of all its *Nitrous Salts*, and masculine parts; reduce it to a fine powder (which may be done even in large proportion, by a rude Engine, letting fall a kind of hammer or beetle at the motion of a wheel;) let this pulveriz'd *Earth*, and for the time unceasingly agitated, be expos'd for a *Summer* and a *Winter* to the vicissitudes and changes of the seasons, and influences of Heaven: By this *labour*, and *rest* from Vegetation, you will find it will have obtain'd such a generous, and masculine pregnancy, within that period, as to make good your highest expectations: And to this belongs Sr. *Hugh Platts* Contrition, or Philosophical Grinding of *Earth*; which upon this exposure alone, without manure of Soil, after the like revolution of time, will, as he affirms, be able to receive an exotic Plant from the farthest *Indies*, and cause all Vegetables to prosper in the most exalted degree; and, to speak magnificently with that Industrious Man, to bear their fruit as kindly with us, as they do in their natural Climates. But a little to abate of this, modestly we may say, that this Culture (easy and simple as it is) will be found effectually able to render the Soil of a most extensive Capacity, for the entertainment of foreign, and uncommon plants. For to enumerate some of its perfections; such as refuse *Dung*, and violent applications, have *here* pure *Earth*; and such as require aid, a mellow and rich mold, impregnated with all the blessings which the Influences of the Heaven, and *efflorescence* of the *Earth* can contribute to it; fitted, as it is, for Generation, and yet so restrain'd from it, as greedily to receive the first *Seeds*, which are committed to it, with a passion, and fervency as it were of animal love. What high, and sublime things are spoken more upon this, I forbear to prosecute; but in Sir *Kenelme Digby's* discourse of *Sympathetic Powder*, he affirms, that the *Earth* in the years of repose recovers its Vigor, by the attraction of the Vital Spirits, which it receives from the air, and those superiour irradiations, which endow simple *Earth* with qualities promoting *fermentation*. And indeed, such a vegetative activity I have often observ'd in the bare exposure of some Plants but for a few hours only, as has rais'd my admiration, particularly, in the *Aloe*, and other kinds of *Sedums*, which, when to all appearance shrunk, and shrivel'd up, have fill'd themselves in a moment, set out in the *Air*, when a very few drops of water (at the same, that is, Winter, time) would certainly have made it rot, and turn to a mucilage, as, to my cost, I have experienc'd. And these Ferments of the *Earth*, by this amity, and genial intercourse with the

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Air, are innumerable, to concoct, digest, accelerate, and restore; equal to, yea, beyond any artificial enforcements of *Dungs*, and *composts* whatsoever. But to return to dust again; by the toil we have mentioned, 'tis found, that Soil may be so strangely alter'd from its former nature, as to render the harsh, and most uncivil *Clay* obsequious to the Husbandman, and to bring forth *Roots*, and *Plants*, which otherwise require the lightest and hollowest molds.

In other cases and affections, the *Earth* may be likewise fertiliz'd as from without, so from within, by more recondite and *central* Causes, and agitations, which if in excess, may be allay'd with some *feminine* or other mixture; since oftentimes, qualities too intense, rather poison dry and choleric grounds, than conduce to their advantage, as we shall come to shew; and that which makes a cold and moist ground fertile, will destroy the contrary, as we see it in too free applications of *salt*; and therefore it requires no ordinary dexterity, to be able to direct where, and what remedies are to be administered; since we find it the same in *Vegetable* productions, as in the *Animal*, where Complexions should be suited; for want of which care, through avarice, and other fordid Circumstances, Noble Families themselves are many times rendr'd Childless, which might else have multipl'd and been perpetuated. To illustrate this by our present subject: We find, that a thin sowing, or sprinkling of *Asbes*, has enriched all the higher Pastures, when, where 'twas strew'd too thick, it became totally barren: sometimes again, defect of sufficient depth may be cause of sterility; and so it frequently happens, that the proper remedy of some hungry, and shallow surface, is, to superinduce and lay more *Earth* upon it, and to find out the *medium* by diligent tryals of some degrees of depths in the same Soil; but solitary, single, or over-hasty Experiments, before the *Earth* be prepar'd by some of our foremention'd Essays, may prove discouraging, and unsufficient, as my Lord *Bacon* has oft advertis'd us.

Earth is also sometimes improv'd by mixtures of Fern, rotten leaves, and the pourriture of old Wood; the haulm of *Beans*; *Pease*, and other *legumina*, which heats, and accelerates Concoction; for which, and all other Medications, the nature of the Mold is carefully to be examin'd, that application be made accordingly; as for instance, If it be *sandy*, or other light mixed *Earth*, to imbody it with something of a fatter nature, as *Lime*, or *Marle*, (for I yet forbear the touch of ordure or animal Composts, as the least natural;) and be sure so to stir, and lay it (especially if with *Lime*) that it may not sink too deep, and suddainly, as 'tis apt to do, and so desert the surface-mold, where it should do the feat, and therefore it is to be the oftner renew'd. But *Marle* enters as properly here, and so does *Mudd*, *Slub* of slimy *Waters*; especially, if the soil be gravelly and mixt, which it will sadden and impinguate, and consequently combine; but if the *Gravel* be wet and cold, *Lime* is preferable: Wherefore the nature of the mold should be well examin'd before the application; as here *arenous* and sandy *Earth* wants ligature, and besides consisting of sharp, and

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asperous angles, wounds and galls, curls, and dwarfs our Plants, without extraordinary help, to render the passages more slippery, and easy; and therefore relenting *Chalks*, or *Chalk-Marle*, is also profitable, with *Calcinations* of *Turfe*, or *Sea-Wrack*, where it is at hand; and if the Soil be exceeding bibulous, spread a Layer or Couch of *Loam*, discreetly mingl'd, at the bottom, to entertain the moisture. In the mean time, there are yet some *Plants* which thrive almost in nothing so well as in *sand* alone, or with very little mixture, nor that of any *Dung*: So *Melons* are said to grow in *Jamaica*; and some vast Timber-trees have little, or no mold adhering to their roots; such is that beautiful stranger, the *Japan-Lilly*, call'd by those of *Garnsey* (from whence we only have them) *La belle de nuit*; and a certain *Palm* of the same *Japan*, which shrinks, and dries at the least touch of *Water*, as if it were laid before the *fire*, which is, it seems, the only remedy that restores it, or the suddain replanting it in *Scales* of *Iron*, or the most burning *sand*: But what if *sand* it self, however vulgarly reputed, be not so hot, or interiorly ardent, as 'tis given out to be? Indeed, for being of an open, and loose contexture, 'tis apt to put forth a forward spring, as more easily admitting the *solar rays*; but it does not continue, and is an infirmity which may be remedied with *Loam*, which not only unites it closer for the present, but is capable in time to alter and change its very nature also, so as too hot a *Compost* be no ingredient with it.

Here I take notice, that *Husbandmen* observe, a too clean and accurate gathering of *Stones* from off those Grounds, which lie almost cover'd with them, rather impoverishes than improves them; especially, where *Corn* is sown; by exposing it to Heat and Cold. Certain it is, that where they are not too gross, and plentiful, a moderate interperion of the smaller *Gravel* preserves the *Earth* both warm, and loose, and from too suddain exhalation; whilst the over-fine grain, or too nice a sifting, makes it apt to congregate, and grow stiff upon wetting; so as the tender *Seedlings*, can hardly issue through; and this is a document for ignorant *Gardeners*, who, when they have a fine *Flower*, think they can never make the ground fine enough about them; yet the finer the *Plant*, or *Seed*, the finer should the *Mold* be which entertains it; though when all is done, Trees thrive best, where they have easiest footing.

Chalky Grounds come next to be consider'd, and they should be treated like *Gravel*, *sand*, and *Stony*, if harsh; but if of the melting kind, 'tis apt to mix with all the sorts of molds, and being of it self so husbanded, composes a kind of natural Soil fit for most uses, sought for and of admirable effect in dry Grounds.

Here now of Course something we are to speak concerning *Calcinations*, all reductions of *Stone* into *Asbes* being of excellent use where *Lime* is upon any occasion proper; and indeed all our *Composts* and *Dungings* serve but to this end, namely, so to qualifie, and mix the Soil, as may artificially answer to the varieties of the natu-

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ral *Earth*, or such a Constitution of it, as the skilful Husbandman requires: As for Instance (since all fertility is the result of mixture contrary in quality) if it want due heat, to apply additions of a fiery nature; and therefore 'twere profitable, if in the using *Lime* with *Turf*, and *Swart*, it were laid alternatively, *Turf* on *Lime*, and *Lime* on *Turf*, in heaps for six months, by which means, it will become so mellow (and rich in *nitrous Salts*) as to dissolve, and run like *Asbes*, and carry a much more cherishing Vigour, than if amass'd in greater quantity; and so, by a too violent application, burn out, and exhaust the vegetative virtue which it should preserve. There is (by the way) this caution to be us'd in burning of *Earth*, that though what is *torrified* into blackness, will exceedingly fructify; yet, if it proceed to adustion beyond that degree, it consumes the *Niter*, which is the principle would be preserved; as we shall come to shew, when we speak of *Salts*, which we are the most carefully to keep intire, in all our *animal* or other *Composts*: If once the *nitrous spirit* be quite mortifi'd, the *Earth* produces nothing, till being long expos'd, it have attracted a fresh supply to give it life and prepare it for conception: For otherwise, all moderate burnings, yea, and even sometimes (to appearance) immoderate (as that of *Rose-trees*, *Reeds*, and some other, which makes them bear and come the better,) is excellent manure, as we see it in *Straw* and *Stubble*, enrich'd as they are with *Salts*; and if the very *Earth* be roasted with the fire, it solves obstructions, laxes the Pores, renders them attractive of the Influences, and to cherish with its warmth; and the more simple and unmixt the *Asbes* be, in relation to what the Ground produces, it is the better: For as *Weeds* bring *Weeds*, so the *Asbes* of *Fruits* and *Berries* (being burnt) dispose to bring forth the same; so as no treatment of the *seminal rudiments* whatsoever, seems totally of power to annihilate their virtue; so strict is the Union of the parts, from whence their *Forms* result. The *Calcination* then of *Earth* alone, not only disposes it to produce great variety, but, if it be intense, increases the very weight of the Mold; whether from a certain *magnetisme* which it thereby contracts (which fortifies it to draw the proper aliment more powerfully) or upon what other account, let the curious examine. *Lime* is useful for cold, wet Grounds, and stiff *clays* a little *stee'd*, as over-heating the dryer.

I come next to *Marle*, of excellent use to fix light *Sand* and dry Grounds; some are for the *White* and *Grey*, others the *Blue*, and *Red* (which I think the best,) according as tis more, or less apt to resolve after wetting; but neither of them discovering their virtue for the first year: It does incomparably on *Pastures*; some on *Arable*, a good Coat of *Compost*, suitable to the land, being first spread, where you will lay it: If your *Marle* be very unctuous and rich, apply it less copiously; the too thick covering is the worst extremity; nor is it always to be us'd without alloy and mixture with other proper Soil; for some *Marle* is more *Sandy* and gritty than other, and should be qualified with a Contrary: Give lean and emaciated *Earth*, a covering of the fattest *Marle*; hot and dry to the

the cold and moist: And this is also to be observ'd in the applications of all other *Composts* and *Medications*.

Marsh, and Churlish *Earth* will be Civiliz'd, by the rigour and discipline of two Winters; *his frigora*, is the old method to make the stubborn Clod relent; and with the mixture of a little *sand*, if it be too close of Body, it will become excellent Mold.

Clay is of all other a curst Stepdame to almost all Vegetation, as having few or no *Meatus*'s for the percolation of the alimantal showers, or expansion of the Roots; whether it be the Voracious, Hungry, Weeping or Cold sort: In these cases, *Laxatives* are to be prescrib'd, such as drift *Sand*, small gritty *Gravel*, *Saw-dust* with *Marle*, or *Chalk*, and continual vexing it with the Spade or Plow; but above all, with *Sea-Sand*, where it may be procur'd, and the burning of the Ground to *asbes*, and all that it bears, the more the better; for by no less severity will this ill-natur'd Mold be subdu'd: *Rotten-wood*, and the bottom of bayne-stacks, is good ingredient to this manure; and if it be a cold and wet sort, strewings of *foot* is good; if very stiff, rubbish of *brick*, *limestone*, and such trash may properly be laid at the bottom, and on the upper part *Composts* of *Dung*; for otherwise no *limings* (which being *stee'd* is raw and cold) may at any hand be applied, especially to the hungry sort, which (as also most kinds of *Marsh-earth*) is subject to *chasm*, and gape in dry seasons; to prevent which, a discreet mixture of *asbes* and *sand* is us'd, for if it be in excess, it over-heats the latter.

I do not reckon *Loamer* among the *Clays*, though it seem to be but a succulent kind of *Argilla*, imparting a natural ligament to the Earth where you mix it, especially the more friable; and is therefore of all other, the most excellent mean between extremes, fastening, and uniting that which is too loose or stony, cooling that which is hot, and gently entertaining the moisture. The *Flower-Garden* cannot be without a mixture of it, nor well any fruit, especially the best *Cider-Apples*, for it be accompanied with a lighter soil.

To sum up all we have said concerning Natural Improvements by mixtures of *Earth* with *Earth*; rather than *Dung*; let us hear my Lord Bacon. He reckons up *Marle*, *Chalk*, *Sea-sand*, mold upon mold, *Pond-earth* with *Chalk*, and the several blendings and tempering of them; among all which, *Marle* we find to carry the preeminence with his Lordship, as the most pinguid, rich, and least over-heating; next to this, *Sand*, as the most abounding in salt; *Chalk* more heating, and therefore proper for *Clay*; cold and spewing grounds, being suffer'd to lie a competent time to resolve before you turn it in; *earth* on *earth*, that is (I suppose he means) the under part upon the upper, or the second *spit* on the first, as we have all along directed at the breaking of fresh ground with the spade.

Another mixture he commends (and which we have likewise newly touch'd) of substances, which are not meer *Earth*, as *Soot*, *Asbes*, not the hard and dry *Cinders* of *Sea-coal* (which we are

too busie with about this Town, where the ground is naturally too hot and dry) but such as is apt to relent, and even the sprinkling of *salt*, where it is *wisely* sown.

A *third* is, the permitting Vegetables, abounding in *fixed salts*, to dye into the ground, *Pease-haulm*, *Bracks*, all sorts of *Stubble* cast on about the beginning of *Winter*: So *leaves* of Trees mingled with *Chalk*, and proper *Composts* of *Dungs*, to heat and preserve the ground from sowing with them, when they are us'd alone.

A *fourth* is (what we have also touch'd) heat and comfort, procur'd by *Calcinations*, the burning of *Ling*, *Heath*, *Sedge*; covering the ground with bushes for a time; enclosures of walls and mounds, when the land lies in the eye of the weather, and in other cases, *meridian* exposures, and the warmth of the woolly fleeces of *sheep* as well as manure, folded or pastur'd: And to this we may add the very *grazing* of *Cattle*, which in some cases has succeeded better than the best *dungy-compost*, especially for old, and decay'd *Orchards*, which have been observ'd to recover to admiration, when mowing has been pernicious; for even the biting of *Cattel* gives a gentle loosening to the roots of the herbage, and makes it to grow fine and sweet, and their very breath and treading, as well as soil, and the comfort of their warm bodies is wholesome, and marvellously cherishing: But this is to be understood of places where the stems are of full growth, and where the beast cannot reach to crop.

Lastly, *Irrigation*, and watering, both by admitting and excluding moisture at pleasure: And certainly, this has (since his *Lordship's* time) been found one of the richest improvements that ever was put in practice; especially, where they have the command of fit and impregnate *waters*, without grittiness, or being over-harsh and cold; whether it percolate through rich ground, or, which is better, descending from eminences, and moderate declivities, from whence we find the Vallies so luxurious and flourishing.

To this belongs the cure of wet and *boggy Lands*, by cutting Trenches deeper than the cause of the evil, which proceeds from some conceal'd Springs hinder'd from emerging forth by the sluggish incumbent earth: This makes the ground to heave and swell, but not giving vent, to stagnate and corrupt both the water and the mold about it: And though it lie loose and hollow; yet it gathers no vigour from above, but remains cold and insipid. The remedy is, opening the ground till you meet with a sound bottom, and cutting your Furrow upwards to the Bog, about a foot beneath the spewing water: This is to be done in several places, and when the drains appear to have wrought the effect, you may fill them up again with *spray* and *barvine*, great and rough *stems*, *brick-bats*, *tileshards*, *horse bones*, or any other rubbish, which will remain loose and hollow, and cover them with the grassy side of the turff which you pared off, and laid apart; on *that*, throw your other Mold, which being cast up in heaps for some time, will be much improv'd with spreading; lastly, sow it over with *hay seeds*.

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But the Cure is yet easier, if the Land lie considerably sloping; and if it happen to be a planted Ground, then cut your Trench deeper than the roots of your Trees, and apply the foresaid rubbish to intercept the moisture. About the latter end of *October*, trench the Ground all over, for near a foot and a half in depth, and when you are come within three, or four foot of the stem, cut off all their larger roots sloping inwards, sparing only the *fibers*, and such of them as you find tender, and about as big as your finger; leaving also the more perpendicular to keep the Tree steady: This done, cast in some rubbish of *brick-bats*, *limestone* (not *chalk*) and other materials, that the Mold may lye easie about them, and with a mixture of good *Earth*, plenty of rotten stubble, or other soil, apply it near the Root, and fill your Trench with the rest; and if your Ground require it, (as being too cold it commonly does) add to your compost the *Dung* of *Sheep*, *Pigeons* or *Poultry* very well consum'd: And because *Moss* is often caused by starving and wet Grounds, than by hot and over dry (for both produce it) the Cure is likewise to be effected by *Ablaqueation*, and *baring* the *Roots*, as above; and for the latter, by a mixture of *Loame*, with the scouring of *Pond* or *ditch-Earth*, which of it self is the most excellent manure; and the planting your Trees at greater intervals, for admission of *Air* and *Sun*; since the scraping of it off (which may also be done in wet weather) is but temporary; and if nothing else be perform'd, it will be sure to grow again.

Lands which are cold and dry, are (as we have hinted) to be improv'd by contraries; namely by application of *compost*, which are hot and moist; as *Sheeps-dung*, burning and calcining of the *Earth*, with the *Vegetables* on it, and the like, to excite heat and fermentation; but which is not to be effected without repugnant remedies, and such as are of *heterogeneous* parts, to stir and lift up the Mold, and render it less unactive. If it be cold and clinging, as frequently 'tis found, there *lime-rubbish*, the small harther *Chalk*, *sea-coal-ashes*, a moderate sprinkling of *sand*, with some proper *compost* may perform the Cure.

Hungry Grounds require to have the cause well look'd into; the water turn'd, (as above directed) or if it want, such as is well enrich'd.

Lands that are hot and burning, allay with *swines-dung*, as (say some) the coldest; or with *Neats*, which will certainly refresh it.

For *Earth* which is too light, there's nothing better than *Pond-mudd*, after a *winter* has pass'd upon it.

Earth over-rank (for there may be some too fat, as well as too lean,) *sand*, and *ashes* will take down; but still with regard to what you design to plant upon it; neither the *Almond*, nor the *Hazel* will endure a wanton Mold; and though it seem a *Paradox*; that any Soil should be too rich, (upon which some *Criticks* have suspected the Text in *Theophrastus*, which asserts it twice in two suc-

Lib. 2. cap. 5. 6.

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in *Plants* as *Animals*, which growing very fat, are seldom prolific. Some on the contrary are so emaciate, and lean, dry, and insipid, as hardly any pains will make them fruitful. Such are *Minerals*, and *Metallic* Soils, devouring *clays*, light and *assy-sands*; so again are putrid and *fungous*; others, though fruitful, producing only venomous *Plants*, *Hemlock*, and the deadly *Aconites*; and some, though whollom ground, may be poison'd with unskilful or malicious mixtures, and with damps and *Arjenical* vapours, which sometimes (though *natural*) are yet but *accidental*, and for a season, as when after extraordinary drouths, and stagnant air, the *Earth* hath not been seasonably open'd, refresh'd and ventilated.

Moreover, Ground is sometimes barren, and becomes unfruitful by the vicinity of other *Plants*, sucking and distracting the juice of the *Earth* from one to another: For thus we see the *Reed*, and *Fern* will not be made to dwell together; *Hemlock* and *Rue* are said to be inimicus; the *Almond* and the *Palm*, which are seldom fruitful but in Conjugation; and perhaps there are *Effluvia*, or certain inconspicuous *steams* of dusty *seeds*, which not only impregnate places where never grew any before, but issue likewise from one to another, as in our *Junipers* and *Cypress* I observe, flowering about *April*; which are Trees of Comfort, and thrive not well alone. The *Ficus* never keeps her fruit so well, as when planted with the *Caprifig*. By what irradiations the *Amyril* thrives so with the *Fig*; the *Vine* affects the *Elm* and *Olive* (which is at Antipathy with the *Oak*, and imparts also such a bitterness to the Mold, as kills *Lettuce*, and other subnascent *Plants*) is hard to say; and why some affect to live in crowds, others in solitude: But that *Firrs*, *Pine*, *Cedars*, *Elms*, and divers other Trees aspire, and grow so tall in society, may be (as from other causes) so from their not overglutting themselves with nourishment (for *Compost* is not their delight) which inclines them rather to shoot upwards, than expand and spread.

Lastly, by *shade* Ground is render'd barren, and by the dripping of umbragious trees: To these *Air* and *Sun* may be soon restor'd, by removing of the screens which intercept them; and yet all shade is not unpropitious, where the Soil and Climate are benign, as well as that which casts the umbrage; and of this we have a notable instance somewhere amongst the *Astomori* even in *Africa*, where the soil and the air are reported to be so genial, that the *Olive* is said to grow under the *Date*-tree, the *Fig* under the *Olive*, under the *Fig*-tree the *Granade*, under that the *Vine*, under the *Vine* a crop of *Corn*, and at the feet of the *Corn* a certain pulse; none of them impeded by the more than reduplicated shades. But there are some, we must confess, amongst us, which are not so propitious; Trees of all sorts (though the *perennial Greens* least) breathe as much after the air as the soil, and do not thrive without it; nor except it be wholefom.

But to return to barren *Earths*, which are either out of heart, by being spent, or from the nature of the soil (in both which, the *Plants* which they produce, though never so unprosperous, run

hastily

hastily to seed, or make an offer, they are to be restored by the Plow, the Spade and the Rake, by stirring and repose, appositions and mixtures of Earth, *Calcinations* and *Composts*; and above all, by the eye of the Master, and dust of his feet, as the *Italian* Proverb has it. For after this Process, and innumerable other Tryals (mixtures of things being endless) all other sorts of *Earths* and imperfect Molds may be treated and mellorated; namely, if it be too hard and close, to mollify and relax it; if too loose, to give it *ligature* and binding; if too light, ballast; if too meagre, to fatten and impinguate it; if too rich and luxurious, emaciate and bring it down; if too moist, apply exsiccatives; if too cold, fermenting *Composts*; if excessive hot, to cool and refresh it; for thus (as we said) *Earths* should be married together like Male and Female, as if they had sexes; for being of so many several complexions, they should be well consider'd and match'd accordingly, things (as was said) becoming fruitful, from the mixture of repugnant qualities; so as cold and dryness without a warm and cherishing moisture, produces nothing; for this therefore you see what choice I have presented you of Sand, Ashes, Chalk, Lime, Marle, mixture of Mold, *Calcinations*, Air, Sun, Dew, Rain, Frost and Snows, Trenchings, Drilling, Watering, Injections, and finally, of Animal Stercorations, and other *Composts*, which is the next, and last part of this (I fear) over-tedious Discourse; Since indeed it is not sufficient to find out even the best, and most grateful Mold in nature, so as to rely for ever upon the same performance, without supplies of all sorts; stirring and repose, constant dressing, and (after all we have said) artificial letations likewise, to encourage and maintain it in vigour.

We proceed then in the next place to what farther advancement we may expect from *Stercoration*, and manuring the ground by *Composts*, and to discover the qualities, which may be latent in their several ferments, and how to apply them by a skilful and philosophical hand, without which they do always more hurt than good; and therefore first we will enumerate their several kinds, and next inquire, what it is we chiefly seek for, and expect from them; and lastly, how to treat them so as may render them fitting for our service.

From *Animals* we have the Soil of *Horses*, and beasts of burden, *Neats*, *Sheep*, *Goats*, *Hogs*, *Pigeons*, *Poultry*, and *Fenny-fowls*: We have also *Flesh*, *Fat*, *Blood*, *Hair*, *Feathers*, *Urine*, *Shavings* of Horn, *Hoofs*, *Leather*, *Skins*, *Fish*, *Garbage*, *Snail-mud*, &c. From *Vegetables*, (as of nearest affinity) we have *Vine-cuttings*, *Stalks*, *fall'n Leaves*, *Marc of the Wine* and *Cider-presses*, *Lees of Wine*, *Oyl*, *rotten-Fruit*, *Gourds*, *Weeds*, *Fern*, *Haulme*, *Stubble*, *rotten-Wood*, *saw-dust*; refuse of the *Tan-pit*, *Sea-wood*, *Linnen Clowts* and old Rags; also *Brine*, *Pickle*, *Ashes*, *Soot*; and of things promiscuous, *Washing of Disbes*, *Bucks*, *Barrells*, *Soap-juds*, *Slime*, and *Scouring of Ponds*, and *Highways*, *Dust*, *sweepings*: In sum, whatsoever is apt to rot and consume in any competent time, and is either salt, unctuous or

fatty:

fatty : To which let me add, impregnating *Rains* and *Dews*, cold and *dry Winters*, with *Store of Snow*, which I reckon equal to the richest *Manures*, impregnated as they are with *Celestial Nitre*. But with all these *Auxiliaries*, we are not yet to imagine, that any of them are therefore profitable and good, because they retain an heady scent ; are *hot, moist, rotten* and *slippery, fat* or *unlustrous*, and the like, which are all qualities, that *alone*, and of themselves, effect little, till they are corrected and prepar'd ; but, for that amongst these materials we detect the causes of fertility more eminently than in other substances ; partly from their *fixed salts*, or some virtue contain'd in them, or rather drawn from without, and imparted to the exhausted and defective Earth ; and that by such a *process*, as by converting them into a *Chyle* (as it were) it facilitates their being infus'd, *assimilated*, and made apt to pass into nourishment, promoting *vegetation*. This obtain'd, the next thing is, how skilfully to apply what we have prepar'd ; and this indeed is a difficultly worthy the *heads* as well as *hands* of the profoundest *Philosopher* ; since it requires a more than superficial knowledge and penetration into *causes*.

We know indeed, that the *Earth* is without any Artificial *Auxiliaries*, indu'd with a wonderful prolific virtue ; but this, for being possible to be lost and decay, (at least for a longer time than our necessities can support) and from some grounds never to be expected without such helps, it may be worth our while a little to consider, by what expedients of *digestion*, or other ways, the desired effect of perpetuating its vigour might best be accomplish'd.

That the secret we enquire after, and which does most apparently seem to *evirtuate* towards this end, is some *Salt*, I suppose is generally agreed : For *Salt* it is which gives *ligature, weight, and constitution* to things, and is the most manifest substance in all Artificial *Composts*.

'Tis the *Salts*, which intice Roots to affect the upper, and saline surface of the *Earth*, upon which the *Nitrous* Rains and *Dews* descend, and the cause that some *Plants*, the most racy, and charg'd with juice of all other, (for such is the *Vine*) thrive so well amongst Rocks and Pumices, and in whatever best maintains this vital pickle.

'Tis *Salt*, which makes all cover'd and long shaded *Earths* to abound in fertility, and renders the dung of *Pigeons, Poultry*, and other *salacious* Corn-fed *Birds*, so eminently effectual, before the soil of *Horses* and other Beasts, in which it less abounds, as having less virtue to attract it.

'Tis *Salt*, that gives such vigour to places, sprinkl'd with *Urine, Soot, Ashes*, &c. which have them not diluted ; and to *Bones, Flesh, Horn, Hair, Feathers, Blood*, and the rest of those *animal excrements* : And whence those *seminal Masses* should proceed after *Calcination* of the *Earth*, when it comes to be expos'd again, is hard to divine ; whence I say, they should derive their life and energy, without being destroy'd by so powerful an agent as *Fire*, unless they lurk in some vegetant, and indissoluble *salts*, (*volatile, fixed*,

fixed, or nitrous Earth) from whence they (*Phoenix* like) emerge, though I do not say without any other *specific rudiment* : But 'tis strange, what, as I remember, Dr. *Morison* affirms of the *Erysimum* or *Iris*, so seldom seen to grow spontaneously in *England* before the late prodigious *Conflagration* of this *City*, when there appear'd more of it amongst the Ruines, than was known to grow in all *Europe* besides, it being a curious *Exotic*, to be found most about *Naples* in the time of *Fabius Colonna*, and but rarely elsewhere.

'Tis *Salt*, which *resuscitates* the dead and mortifi'd *Earth*, when languishing, and spent by our indulgence to her verdant Off-spring, her vigour seems to be quite exhausted, as appears by the rains, and showers which gently melt into her bosome what we apply to it, and for which cause all our *Composts* are so studiously made of substances which most ingender or attract it.

'Tis *Salt*, which fertilizes, and renders *Egypt* so luxuriously fruitful after the inundations of *Nile* ; and the *Nitrous* grounds of *Jamaica*, and other places, which cause so stupendious a growth of *Plants* and *Trees*.

'Tis the want of *Salt*, which *emasculates* the virtue of *Seeds* too long macerated in hungry water, and renders *floats wood* such unprofitable *fuel*, and to turn into such insipid *ashes* ; and whatsoever it be some *Plants* may appear to affect, as to the external differences of appetite, some of them seeming to draw in more *Air*, some *Earth*, and others *Water* in extraordinary measure, according to the several contextures of their parts, or by whatever *Magnetisms* and attractives, it is still to come at their *Salts*, which doubtless create that inclination, compose the various *saps*, and *juices* which they present us. Nay, what if I should say, that all the several parts of *Vegetables* were endow'd with their peculiar and distinct *salts*, through different *motions, complications* and *percolations* ? or, that so many *Earths*, so many kinds of *Salts* digested and transported by their different *Vehicles* and strainers ; and those also, though unlike in quality, yet perfectly congruous to what they produce and nourish ? But what this *Vehicle* or *Menstrue* is, I contend not ; 'tis evident, that *Salts* unite best with water, *Vernal* and *Autumnal Showers* and *Dews*, as the most apt to convey their insinuations. You know, who have dignified *Salt* with the prerogative of being nam'd *Element-earth*, the *vigour* and *close* of all things, yea, the first and last *Elementated* bodies : What shall I say, *quid Divinum*, the Original of all *secundity* ; nor can I say less, since there was nor *sacrifice*, nor *discourse* acceptable without it. And verily upon serious contemplation of the premises, and the little experience I have had of their effects, in this work of *vegetation*, as far as I am able to penetrate into causes by them, I am not displeas'd at the magnificent *Epithetes* which are given it. In the mean time, I know there be, who are so averse to this Doctrine, as to prefer *Water* before it, nor contend I with them, so they allow the near affinity and friendship which is between them, as I have deduc'd it at the entry of this Discourse, where I describe my *Autoptical* observations of the several *Earths* : that

that I pretend from hence, being only to excite us to make diligent enquiry, what may more likely be the *cause* of *Vegetation*, and whether *Salt* have not a *Dominion* almost *Monarchical* in this great Work of Nature, being so absolute an ingredient in all our *Dungs* and *Composts*, which I am next going to speak of. I cannot in the mean time but wonder, how a thing so eminently sacred, and fertile, should come to be the *Symbol* of *Malediction*, when, as the custom was, they us'd to sow *Salt* in the place of *Cities* they had eras'd and curs'd, there being in all Nature nothing so pregnant and fruitful, unless it were to invite the *Plow* to go there, and that the fertility of the spot for *Corn* and *Grain* might divert them from rebuilding and covering it again with houses. Indeed to apply *Salt* in excess, burns the *Earth* for a time, so as nothing will grow upon it; but when once the rains have well diluted it, it springs up more wantonly than ever: This I daily find by sifting common *Salt* upon the *gravel-walks* of my *Garden*, and for which cause I have left it off; and we find that the *Earth* it self over-marl'd and too highly manur'd is as unprofitable, as if it were barren for the time, and that there is in all things a just proportion to be observed.

But neither all this while do I pretend, much less determine, that the *Principle* I so much celebrate, is our common artificial *Salt*, compos'd of *Urine*, and the like, which of it self is so burning and destructive, till its *acidity* be qualified by the *air* and *showers* from Heaven (which endows it with a natural *magnetism*, to receive their irradiant virtues;) but a certain more *unctuous spirit*, or *airy Nitre*, pregnant with a *vital Balm*, which is the thing we endeavour to find in these materials of *Composts*: But whether it be *accidental*, or *essential*, *corporeal*, or more *spiritual*, *principal*, or *organical*; or (to speak with the *Chymists*, and later *Atomists*,) whether communicated by *effluvia*, *salts embryonate*, or *indigested* and not *specificate*; from *ferments*, *spermatie vapours*, *influences Celestial*, or from liquor only impregnated and concocted, I leave to those who affect to wrap up *ease* notions in *hard* and uncertain terms, whilst the thing would be of use to the *Philosophical Husband-man*, were their reduction into just *Classes*, for the better discriminating of the several *Composts*; as what there's of them most abounds in *Nitrous*, or *Urinous* parts; or what of the nature of our crude, common *Salts*, and *Kali's Mineral*, or other; and thereby be able to pronounce, *where*, and *how* we may apply them with safety and success: For some we know are plainly extital and deadly to *Plants* (such as the *Mineral*;) others properate too fast; and some are sluggish, and scarce advance them at all. It would therefore be consider'd, whether any *Salts* do universally nourish all *Plants* alike? or rather partly, some one Plant, some another; for upon the clear decision of this *secret* depends all that is truly curious in this affair; laying, as I do, for *position*, that the improvement of all the *Earths* and *Soils* I have spoken of, results from some *Salt* or *Spirit* (call it which you please) as from an indispenfable *Principle* in this of *Vegetation*, and per-

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haps the *first rudiment of life* in all things else: And till we shall arrive to this (by what I have observ'd in the discreet use even of our common *Salt*, *brine*, the effects of *Urine* and the like,) I firmly believe, that were *Salt Peter* (I mean fictitious *Nitre*) to be obtain'd in Plenty, we should need but little other *Composts* to meliorate our Ground; since, whether that which so fertilizes it, by any mixture we can yet devise, effect it from any other cause, is greatly to be doubted; nor do I think, but the charge of extracting it, (at least sufficient to impregnate *Water* in convenient quantity) might be compas'd by the industrious *Farmer* without much inconvenience, or the least difficulty, were he competently instructed in the process of *Calcination*, *Resolution*, *Percolation*, *Evaporation* and *Separation*, put into honest *English*, and easily to be learn'd: Soon we should then see, that this were not to be extracted altogether out of stinking *dung*, and found in heady trash (which yet is material) but rather in the well-impregnated and natural Mold it self, charg'd with a more generous spirit, or medicinal *Nitre* (in congress with a certain *sulphur*) capable to wait, and excite to vegetation, beyond all we can promise from any meer artificial *ferments*, much less our common mixtures, and ways of *stercoration*, which in time grow cold and languish, and are so quickly check'd.

And now after all this, I dare not say, that there is nothing more than this meer *Salt*, or spirituous *Nitre*, which concurs to those desir'd effects, that promote fertility, and set the ferment on working: What *ignite particles* beside, and special *Composts* there may be of consanguinity and near alliance to the respective *vegetables* (which we know to be of vast difference one from another,) we pretend not to determine; for some *Plants* are very brisk and quick, others insulfe and flat; some are acid, others more *dulcorous* and sweet; they are *salt*, *sowre*, *luscious*, *austere*, *hot*, *bitter*, *moist*, *dry*, *astringent*, and of strangely different qualities, not to speak of their effects, which it were hard to number. Therefore, that the same *Compost*, or remedy should be promiscuously universal, is the more unlikely, and would be well consider'd: But admitting this to be salvable, and that we find by experience, a well digested *Compost* beneficial to almost all the vegetable Family; may it not in all probability spring from its participation of all those varieties of *ferments*, (in some at least, though in different proportion) which we have been speaking of? as by which each single *species* draws and *assimilates* that only to it self, which it finds most *amicous* and congruous to its nature; and if so it be, then have we no more to do, than to learn how to prepare our *Ferments*, and apply them accordingly; namely, *acid* to *acids*, *sweet* to *sweets*, *benign* to *benign*, and so the contrary, as we would promote its natural quality; and this perhaps, either by reducing some parts of them into *Composts*, as their *leaves*, *stalks*, *fruit*; or by some more refin'd extraction of their *salts*, convey'd in proper *vehicles*. And for the better administering of this, the nicer textures of *vegetables* should diligently be consider'd; their several

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vessels,

vessels, and *Organic* parts; since every impregnate liquor is not presently fit for all alike; the figuration of their *Labiola*, and curious pores (which 'tis likely draw several juices and spirits) being very different; as the most sagacious Doctor *Grew*, and learn'd *Malpighius* (both Ornaments of this Illustrious Society) have begun, (I think I may say, well nigh perfected) the way to us, in those elaborate *Anatomizations*, which the world will shortly admire. I insist the rather on this, because we find some *Plants* to reject divers rich compounded liquors, especially such as pretend to work Miracles in the *Protean* changes of *colours*, and other qualities, from *mineral* or other substances; and that the very *Rains* and *Dews* differ in several *Climes*: So as even from this reason alone, to instance in no more, all *Plants* do not easily become *denizens* in all places:

—Nec omnis fert omnia tellus.

I might add to this the niceness of their *palates*, and fondness to their own *homes*, and to live some in *confort*, some in *solitude*, some on dry banks, some in watry puddles, and some as it were in the very air, and fiery soils; nay, some which are found to destroy the vegetable virtue where they grow; for such are said to be *Oùde*, *Hemp*, &c. and if it be true and constant, that all our imbibitions of *Salts* and *Composts* signify little to *Earth* preimpregnated with a *salt* or virtue, different from what the *Plant* does naturally delight in, some obscure footsteps of which every *Plowman* seems to discover, which makes him change the Crop in some places yearly: For the first, second, or third burden of the same grain, especially *Wheat*, will exhaust that which is its proper aliment, and then leave the rest to more ignoble grain, which will be found to thrive well enough, till at last several successions of different Seeds quite wear it out, and then it must repose, or be manur'd with *Composts* for fresh life and vigour. And to this we may add, how some *Plants* again require little change, or help of Art; such as most of the *Perennial Greens*, and amongst these, the most *refinous* and oylie, as the *Pine*, *Fir*, *Cedar*, &c. which thrive on barren Hills, and grow in Rocky Crannies, without any Earth almost to cover and protect their Roots. Of this sort I have a *Cedar-Table*, which was law'd out of a *spur* only of a monstrous Tree growing in the *Barbadoes*, which held six foot long, five foot broad, and three inches thick, form'd, and wrought as it stands upon the frame; and his *Royal Highness* had another of a much larger dimension, namely eighteen foot in length, and nine in breadth, cut out of the Stem, which was of prodigious growth, to be fed and nourish'd as it was between the barren Rocks. But to proceed; we find that most *esculent* and *culinary* Roots do rather chuse a rich, natural and light Mold, inclining to sand, than what is forc'd, or overmuck't; and how much they yield to soil, growing hard, short and fibrous, and contract the smell and relish of the *ferments*, apply'd to accelerate their growth (for according to the *Italian* Proverb,

verb, *Ogni pianta serba della sua radice*, Every Plant has a smack of the Root) I have already mention'd; so as to confide in *Dungs*, as our vulgar *Gardeners* about this *City* do, is no encouragement; and therefore some, not without good reason, prefer the *Corn* and *Grain* which is reap'd from *Marle*, *Chalk*, *Lime*, and other more natural Manure, before what is produc'd from a Crop which grows on a *Dung-hill* in comparison; experience also shewing, that the cause of *faintness* many times proceeds from the impurity, and rankness of the dressing; and therefore we omit to enumerate amongst our Soils, *Stercus humanum*, which howsoever prefer'd by some before all other, and mention'd by *Columella* with that of *Fowl* and *Cattel*, does (unless exceedingly ventilated and air'd) perniciously contaminate the odor of *Flowers*, and is so evident in the *Vine*, as nothing can reconcile it.

To give some instances of the nature of particular and simple *Composts*, (for so I take leave to use a *Solecism*, till they are blended together with the rest, as we shall afterwards shew) what ever they be, they are by no means fit for the *Earth*, and use of the Husband-man, unless, besides their richness, they be perfectly well digested, made short, sweet, and almost reduc'd to a crumbling Mold; so order'd, as not only not to lose any of their virtue, but improve it, and to excite, entertain, and communicate heat, and vegetative Spirits to what you shall apply them: And that this is not done *per se*, that is, by immediate application, without prejudice (unless it be for the *Hot-Bed*, which yet has an *Intermedium* of Mold) experience tells us, especially in the soil of *Animals*, which is of all other the most active, as consisting of *Heterogeneous* parts, and repugnancies, without which no fermentation could be obtain'd. Now since many of these being freshly made, are not only sensibly hot, but *mordacious* and burning, they are with caution to be us'd. That every kind of *Earth* (as well as the *Dung* of *Beasts*, &c.) has its peculiar *ferment*, and operates accordingly, either by attracting something to it, or embating what approaches it, sufficient has been said; together with directions how to mingle and attemper it, as best may qualify it for Culture. That we may do the like with the several sorts of *Soil*, let us consider what their natures are, what their correctives, and how to apply them.

Horse-dung, the least pinguid and fat of any, taken as it falls, being the most fiery, excites to sudden fermentation above any; wherefore, as we said, 'tis then fit only for the *Hot-Bed*, and when that fervour's past, may be spread on fields, where we would have a rank Grass to spring; but is at no hand to be admitted into the *Garden*, or where you desire good *Roots* should grow unless the ground be very stiff, cold or wet, and then too it had need be well rotted, lest, instead of curing it, it leave *couch*, and pernicious weeds, worse than the Disease; the *seeds* of *Hay*, and other *Plants*, of which the *Horses* eat, coming oftentimes intire from them: And such *vegetables* do commonly spring up from the *Soil* of *Cattel*, of which they chiefly eat; as long *knot-grass* from this Beast; short, clean and sweet pasture from *Sheep* and *Cows*; the *Sonchus*, or Sow.

Sow-thistle from the *swine*: So as ground muck'd with *Horfe-dung* is always the most infected of any, and if it be not perfectly consum'd, it makes your *Roots* grow forked, fills them with *worms*, and imparts to them an unpleasant relish; but being laid on at the beginning of *Winter*, and turn'd in at *Spring*, it succeeds sometimes with *Pulse*.

The Soil of *Asses* is highly esteem'd, for its being better digested by the long *mastication* and chewing of that dull Animal; but since we have no quantity of it in this Country, it does the less concern us.

Neats Dung, of all other is universally the most harmless, and the most useful; excellent to mingle with *sandy* and hot grounds, lean or dry, and being apply'd before *winter*, renders it the most like *natural Earth*, and is therefore for the *Garden* and *Orchard* prefer'd to any other. To use it therefore with the most certain success in such thirsty Grounds, apply a plentiful surface of it, so blended, as the rain and showers may wash in the virtue of it thoroughly; but this is best done by making the *Dung* the finer, and what is reduc'd to *powder*, sprinkl'd for the *Garden*, or otherwise working it in at a soaking wet (not stormy) season, and then leaving it also cover'd with it for some time, if the rain descend in too great excess.

The next is *sheeps Dung*, which is of a middle temper between that and *Pigeons*; profitable in cold Grounds, and to impregnate *liquors*, of choise use in the *Garden*.

The *Dung* of *swine* is esteem'd the coldest and least *acrimonious* (though some there be who contradict it) and therefore to be apply'd to *burning* Lands; but always so early *inter'd*, as never to appear above ground, where it is apt to produce *weeds* in abundance, from the greedy devouring of what that *Animal* eats. This, though not so proper for the *Garden*, is said yet to *edulcorate* and sweeten fruit so sensibly, as to convert the bitterest *Almond* into sweet, and therefore recommended, above all others, for experiments of *change* and *alteration*: Some qualifie it with *bran*, or *chaff* well consum'd, greatly comfortable to Fruit-Trees, but especially the *hairs* and *bristles*, buried about the Roots of *Pear-Trees*.

Pigeons Dung, and that of *Poultry* (especially of *Aquatic Fowls* which is too fiery) full of *volatile salts*, is hot and burning, and therefore most applicable to the coldest ground. There is nothing so effectual to revive the weak and languishing Roots of *Fruit-trees* laid early to them; but first be sure they pass their *mordicant* and piercing spirits, and be discreetly mixt: Be this therefore observ'd as a *constant Rule*, that the hotter *Composts* be *early* and *thinly* spread, *et contra*, the Colder.

Very efficacious is this *Dung*, to keep *frost* out of the *Earth*, and therefore of great use to cover the Mold in *Cases* of *Exotic* and tender Plants; but if the heat be not well qualified, the very *steam* will kill them in a moment; therefore let a full *winter* pass over this *letation* for moist uses. The best way of preparing it, is to

to reduce it into *powder*, and mingle it with the Mold, and to water with its *infusion*, which alone does wonders; or, if it have been well expos'd and abated, you may use it at the *spring* without addition: But if you desire something that is exquisite, macerate it well rotted in the *Lees* of *Wine*, stale *Urine*, and a little *Brimstone* beaten very fine, to mingle with your *Earth*, for one of the richest *Composts*. Then is this only to be noted, that, as the effect of this *Dung* is suddain, so it lasts not long, and therefore must the oftener be renewed.

The flesh of *Carrian*, and dead *Animals*, being (as, I think, my Lord *Bacon* tells us) prepar'd already by so many curious *Elaborations* of its *juices*, is highly effectual; but it should be very well consum'd, and ventilated, till it have quite lost its intolerable smell, and therefore never apply'd too crude.

Blood is excellent almost with any Soil where *Fruit* is planted, especially the *Mural*, to improve the blood of the *Grape* of great advantage, being somewhat *diluted*, and pour'd about the Roots. It has been assuredly reported by divers Eye-witnesses, that after the *Battel* of *Badnam* fields in *Devonshire* (where the late Lord *Hopton* obtain'd a signal victory) the *Carnage* being great, and happening in that place; the *blood* of the slain did so fertilize the fields (where *Corn* had been sown a little before) that the year following produc'd so extraordinary a *Crop*, as most of the *Wheat-stalks* bare *two, three, four, yea to seven* and some even to *fourteen* Ears, a thing almost incredible: The Owner of the Land seeing his ground so miserably trodden by the *Horse* and souldiers after the conflict, intended to reflow it, as believing all his former labour lost; but being dissuaded from his purpose (perhaps to make the experiment) it happen'd as you have heard.

Urine, for being highly spirituous and sharp, had need be well correct'd, and then, being mingl'd with other *Composts* to allay its acrimonious salt, it hardly has its equal.

Hair, Horn-shavings, Bones, Skins, Leather, &c. are deeply to be buried, and so as not to touch, but lie about the Roots: These, with *Rags*, coarse *Wooll* and *Pitch-Marks*, improve the *Earth*, as being full of volatile salts, drawing, and retaining the dews. And *Fish* is likewise spread to great advantage of Grounds, where 'tis to be had in plenty; and for being quickly consum'd, may soonest be apply'd. Welcome to *Vegetables*.

The *Marc* and pressings of the *Grape* are good *Compost*, and so is the *Lees* of *Wine*, mingled with the Mold: It is of singular comfort to the Roots of *Orange-trees*, and *Cafe-Plants*; and if you sift a little *brick-dust* with it, and bury it near the Roots of *Rose-mary*, it will thrive wonderfully. It may be a laudable *Compost* for moist grounds, where that Plant so unwillingly grows.

The *Leaves* of *Trees* are profitable for their own *Fruit*, and natural, being well rotted, and not musty: The *Peach-leaf*, hurtful to *Cartel*, is excellent for the *Tree* from which it falls; and the *Walnut-leaf*, noxious to the grass, is helpful to the *Tree*.

Duck-

Duck-weed, the slime and spongy *ouze* of stagnant waters, mixed with proper mold, make a kind bed for *Aquatics*.

Saw-dust, *Rotten wood*, found in the hollow of decay'd *Trees*, under the *stacks*, and where *Trees* grow thick together; as in great and old *Woods*, but especially, that which is taken out of an inveterate *Willow-tree*, is preferable to any other for the raising of *Seedlings* of choice *Plants*, mix'd as it should be with a little *Loam*, *Lime-rubbish* and *Mold*, as we have taught. This, and the rest should be well ventilated, and is of great effect to loosen and mellow ground, as tenacious of moisture.

Wood-ashes, rich and impregnate with *salts*, are fit for wet Ground without mixture, and in pasture, excellent, not fifted-on overthick: In the *West-Indies* near *Guatemala*, *Gage* tells us their *Manure* is the burning of *Trees* to *Ashes*, of which they do not spread above one *Bushel* upon an *Acre*: It likewise kills the *Worm*; but in *Earth* which is subject to over-heat and *chop* much, *Ashes* and burning *Composts* do but increase the feavot, and therefore contrary remedies are to be sought; such as *Neats* and *Swines Dung*, but not so when *Lands* are naturally, or accidentally cold: Wherefore we should endeavour by all means to detect, as far as we are able, the quality predominant both of the *Earth* we would improve, and the *Composts* we apply, and not throw them on promiscuously upon every thing without considering of what temper and constitution they be; for *Grounds* are as nice as our *Bodies*, and as obnoxious to infirmities upon every defect and excess; and therefore it requires skill, and no little study to be able rightly to marshal this *Materia Medica* (as I may call it) of *Composts*, the virtue of which does sometimes lie very hidden; at least, if that be true which *Sir Hugh Plat* affirms, that what we all this while seek after, is indeed altogether invisible to humane eyes, and to be discern'd only by the eyes intellectual, because 'tis veil'd and clad under so many different bodies, whereof some are more ponderous, such as *Marle*, *Chalk*, the *Dung of Beasts*, &c. some more light, as their *Flesh*, *Bones*, *Hair*, &c. and some yet lighter, as *Grain*, and generous *Seeds*; for in such as have *Virtue* to multiply their own *Species*, that *Spirit* is invested with a very thin and curious integument, as in effect we have instanc'd in the *Blood* and *Flesh* of *Animals*, so much more powerful for the enriching of *Land* than their *Dung* and *Excrements*; this industrious man computing it to no less than twenty times, and to the same advance above this, *Hair*, *Wool*, and calcin'd *Bones*, &c. and as to the courser Soils, that the *Dung of Pigeons* and *Poultry* does as far exceed that of *Beasts* which feed on gross *Vegetables*; and tells us, it has been found upon experience, that one load of any sort of *seed* contains as much *Virtue* as ten load of ordinary *Dung*; and therefore 'tis advisable, that upon all removals of *Corn-ricks*, *Hay stacks*, &c. the *Husbandman* reserve all he can of the *bottom*, *assal* and *stakings*, and to mingle it with *Chimney-foot* and *Blood*, and with that to reduce it into the consistence of a *paste*: To this add as much dry'd *Neats-dung*, temper'd with *Urine*, and made up in cakes

cakes as big as household loaves, and after all is well dry'd in the shade, crumble them to dust, to be sifted or sprinkl'd on the ground for a very considerable improvement; we say *sprinkl'd*, because they should never be too thick, especially for *Corn* which it either cloyes, or over-heats, according as 'tis qualified: Thus, *Pigeons-dung* burns *Seeds* on hot ground, but is excellent for *Barly*, &c. sown on the colder mold.

Of like effect is *Earth* blended with *Malt-dust*, or putrified and decay'd *Corn* reduc'd to *Meal*; so is the dust of old *Fur-bushes*, (in *Devonshire* call'd *Dress*;) but this *last* should not be taken in *Seed-time*, lest it infect the *Ground* with a *Plant* not easily extirpable.

Lastly, The *Mud* of *Ponds* and stagnant waters of *ditches*, shovel'd up, and well air'd, is best apply'd to *Roots* of *Trees*, but especially the *dust* of untony *High-ways*, where the drift of *Cattel*, and much passage is: Let it be carried off from *March* to *November*; for it being already a kind of refined *Soil* continually stirr'd and ventilated, there is no *Compost* preferable to it for any use: It is prepar'd in the highest degree, and will need no wintering, but may be us'd immediately; and so may *straw*, *hawn*, and other *littier* tramp'd on in dirty streets, after it is a while rotted and mingled. *Mr. Ray* tells us that in some places about the *Alpes*, he found them sowing *dust* upon the *snow*, as he supposes, for manure, and to fertilize the dissolution.

Thus with no little industry are found out the several kinds of *Composts*, and materials of improvement, and what is the most genuine and true medicament of every *Soil* for *Arable*, *Pasture* or *Garden*. I do not say all, or as if there were no more; for what if indeed there should be as many sorts of *Composts*, as there are of *Ferments* or *Salts*; and as many sorts of *Salts* as there be of *Vegetables*, or any other putrifiable matter? The more there be, the greater ought to be our industry and skill to be able to distinguish them, and to know how and when rightly to apply them.

Nor is it sufficient to consider the nature of the *Earth*, *Mold*, and several *Composts*, but of the very *Plants* themselves, for the application of what you administer, be it for *Food* or *Medicine*; as if they be cold of Constitution, to make use of the hotter *Composts*; if hot, to prescribe the cold: For instance in a few of the most useful only:

Fruit-trees do generally thrive with the soil of *Neats* and *Hogs*; most *Flowers* with that of *sheep*, but especially *Roots*. *Peter Homdin* tells us (in his Book intitl'd *Daper incensas*) that by the sole application of *sheeps-dung*, he produc'd a *Keddish-root* in his *Garden* as big as half a mans middle, which being hung up for some time in a Butchers shop, people took for an *Hog*.

Apples affect a pretty rich soil, with a dash of *Loam*, but they will bear even in *Clay* well soil'd, and mix'd with *Chalk*, especially the more hardy winter fruit; and in *Chalk* alone for some years, but they produce, though sweet, not so large *Fruit*: But both *Apples* and *Pears* have a better relish in *Grounds* that are not

over-moist, and where they may stand warm, and the last will prosper well enough where the soil is mixt with *gravel*, and has an harder bottom.

Cherries, Summer and Stone-Fruit, such as have their Roots like thrumbs, desire a fine light Mold, *sand* or *Gravel*, with *Chalk*, and good *Compost*, unless it be very coarse and stony, in which case it would be well foil'd, and the pit you plant in, fill'd with rich Mold, as far as the Roots likely use to extend before they reach the *Gravel*, so as to make good spread; and this to be renew'd every third or fourth year; and for this reason it is profitable sometimes to bait sterile Grounds, by laying your *Composts* at reasonable intervals, thereby to tempt and allure the Roots towards it, and keep them from wandering, which they will be subject to do in search of fresh nourishment: For to bear constantly well, and much, *Fruit-trees* must have frequent *letations*. Nor are we to judge, that what is excellent Ground for one sort, is so for another; since that which is perfectly good for *Corn*, is not so for all *Fruit-trees*, and a slender straw will be fed and brought up with a great deal less substance and virtue, than what will serve to furnish the stem, bulk and head of a fertile and spreading Tree.

Vines (than which there is no Plant more sensibly retains the different qualities of *Earth*, or whose juice is of more variety) rejoice in light, but vigorous, Mold, rather *Sandy*; and inclining to dry, than either fat, luxurious or moist. *Lime* temper'd with *Blood*, exceedingly recreates it, after the first accidental heats are pass'd over.

The *Fig-tree*, (though affected to dry Grounds) is no lover of *Stercoration*, yet in some Countries they apply *Oyl-Olive* and *Dover-dung*, to cause them to bear early fruit; but omitting the *Oyl*, if the *Dung* be mingl'd with *Lime* and *Ashes*, it is not to be reprov'd: This *Fruit* thrives, and ripens even in the shade, and Northern exposures with us in the meridional parts of England.

Artichokes thrive exceedingly with *sheeps-dung*, which apply'd to the Roots make them produce very great heads: In the Island of *Jersey* they use *sea-wrack*, to a wonderful improvement of that plant.

Melons, *Asparagus*, and most hasty growers, participate evidently of the Soil; and therefore we have already shew'd, how new, and heady dung contaminates; and this is (amongst other) the reason why in the more Southern Countries (where they are planted in the natural and unford'd Mold) they are so racy and superiour in taste and flavour to ours. I should therefore recommend the use of *sheeps-dung*, well reduc'd, or rather the ashes of burnt *straw*, and the hotter dungs calcin'd for some tryals to reform it; or, as they do in *Italy*, mingle *Dust* and *Earth* manur'd with *sheeps-foal* and *wood-ashes*; if after all we have said, the cause of our application of *Composts* and *Dungs* to these rarer and choice productions, be not to prevent the rains only; for otherwise too rich Soils impair the most delicious Fruits, rather than improve them; and *Grapes* and other Fruits are sooner ripened which stand near the Highways,

ways, much beaten by passengers, than by all that you can lay to the Roots, or spread on the Ground for that purpose, the *Dust* investing both the Tree and Fruit with a kind of refin'd soil, mellow'd with the dews and gentle showers which fall from Heaven.

To give some instances; *Roots*, as we have shew'd, desire deep Ground; *Fruit-trees* not so, which should never go deeper than the usual penetrations of the Sun; for no farther is the Mold benign: Besides that they but too propenly sink of themselves, especially *Bulbs* of *Flowers*, whose fibers easily draw them down, and then they change their artificial and accidental beauty, and (as we call it) degenerate; but *Trees* will grow and thrive, if planted on the very surface, with little covering of Mold, so it be oft refresh'd and establish'd against the wind. Besides, we find, that even the goodliest *Fruit* (as well as some *Timber-Trees*) have many times the hardest footings, with reasonable depth of *Earth*: So little does it import to have it profound; and therefore in soft and deeper *sands*, they thrive nothing so well, as on *Chalk* and *Gravel*, so long as the root can be kept from descending; in which case you should (as we shew'd) bait the Ground towards the surface, and keep the roots from gadding too far from the stem; for the lower roots are frequently starv'd by the upper, which devour the nourishment before it arrive at them: Thus *Gardeners* should sometimes humour their *Plants*, cook, and dress their *foods* to their appetite, and as they can well digest it.

To give some other profitable instances of this nature; In *Transplanting Trees* (beginning early, and when the *Earth* is most tradable) endeavour to make your Mold as conatural to that of the place or nursery from whence you remove them, as you can. 'Tis not therefore material, it should be so much richer; but where *Imp-Gardens* are poor, the tender *Plant* (like a *Child* starv'd at *Nurse*) does seldom thrive where ever you set them; and therefore they should have fair and spreading roots, and be well fed, what ever some pretend. For other rare shrubs and Plants, the *Orange* (*Herrera* tells us) thrives well with the *ashes* of burnt *Gords* and leaves, and needs not change of Mold, even in the *Casle*, above twice a year, and that towards the surface; but *Amonum Plinii* is a strange waster of *Earth*, and should continually be enrich'd and planted as it were all in dung; to the *Myrtle* and *Pomegranat*, whilst the *Red-Rose*, *Capers*, *Sampier*, and other Shrubs and Plants thrive better in *Gravel* and rubbish; *Sage* with ashes, and so *Porcelain* with dust and sweepings: *Rue* affects the dry Mold, *Lettice* the moister; *Flowers* for the most part detest the *Dunghil*, but if any, that of *sheep* or *Neat* mixt with *Loam* and light *Earth*: *Tulips* delight in change, and rather in poor than rich Mold; yea, sharp, and hungry to preserve their *variegations*: But because 'tis sometimes troublesome to transplant them yearly; place a layer of short *stable litter* a foot beneath your Mold, and you will find they may remain unremov'd for some years without prejudice. The *iris* loves the dry beds; *Crocus*, a mixt, rich and light soil: *Carnations* would have a *Loamy Earth*, qualified,

qualified, if too stiff, with *sea-sand*, and *Sheeps-dung*; if too poor, with richer Mold; so the *Péonv. Anemony, Ranunculus*, and other Flowers; but then lay it at the bottom, such as you take from the last years *Hot-bed*, giving it a surface of *under-turf*, which has been foder'd on, sweet and air'd: In this to plant your Roots, but so as not to touch the *artificial* Soil, but rather let it lie about the *Pasture-Earth*, in which your *Bulbs* should always be planted: For all *dung'd* Earths canker the roots of *Flowers*, whilst their fibers, reaching the heartier Mold, draw from it without danger. But if you would indeed be provided of excellent Earth to plant most *Flowers* in, lay *turf* of *Pasture-ground* in heaps for two *Winters*, till it be perfectly consum'd: This is also admirable for *Tuberous* roots, and indeed all up-land-mold, whether *Sandy* or *Loamy*, may be made perfectly good with *Neats-dung* laid on the surface about *Micahaelmas* for one year, that it may wash kindly in; then in *September* after, pare this turf off as thin as you can, and for the first foot depth of *Earth*, you have bedding for *Bulbs* and *Tuberous* Roots superiour to any other. Another proper mixture (much in esteem with our *Gardeners*) is hollow *willow* *Earth* a fourth part, sifted from the grosser sticks, with almost an equal portion of *Sheeps-dung* (*Lawrenberg* says, *Goats* is better) with a little natural Mold; and indeed this is excellent to raise any *seedlings* of *Flowers*; but for the more minute and delicate, such as *Cypress*, *Mulberie*, the *Samara* of *Elme*, and the like, prepare a Mold almost of powder, gently refresh'd with a dewie *Spurge* or brash, not with the watering-pot, which plainly glutts it.

Auricula, Anemonies, &c. should be raised in the *Willow-mold* describ'd above, but planted forth where *Neats-dung* and *Loam* is sifted among the pasture Earth.

The *Pine* and bigger *kernel*s make great advance by being coated with dung, which being grown to great Trees abhor in. Touching change of *Crop*, something has been said already, and *Pease* degenerate betimes, at least in two or three years, be the Land never so good; so 'tis observ'd, that most Plants long standing in the same bed, impair both the Ground and themselves, especially *Sorrel*.

To Conclude; for a general good *Garden-soil*, take the natural *under-turf*, if it be not too stiff; add to it a quarter part of *Neat* or *Sheeps-dung* perfectly consum'd; one bulhel of *slack'd Lime* to each load of Mold, with some sweet, though rotten *Wood-pile* or *Willow-Earth*, mix it well together; and you have a choise composition for all your rare *Exotics*, *Oranges* and *Cafe-sprubs*; remembering to place the spray of rotten bawins, hampers or baskets, to keep the Mold loose, with *Lime-stone*, *Brick-bats*, *Shells* and other rubbish at the bottom, that the water may pass freely, and not rot the *fibers*: And therefore be careful never to make your *Cases* close below, but rather so *bar'd*, as to be able to keep the course materials from dropping through, whilst auger-holes (though never so thick boards) are apt to be stop'd up, and then your roots do certainly rot, and your trees grow sick. The same is to be observ'd

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in *Pots*, and that you place them about an inch from ground, that they may freely drain, and as freely receive refreshing. But I must not quit these curiosities, to speak of the cooler Composts, till I have describ'd the best *Hot-bed* that I know of.

Dig a Pit or *Fosse*, *hot-bed*-depth (four foot is sufficient) and of what figure and dimension you think will best entertain your furniture for it; if it be twenty foot in length, and ten foot broad, I think it competent: Line the sides with a wall of brick and half thick; fill this pit with fresh soil from the stable, trodden as other *hot-beds* are, but without any Mold on the surface. In this place *Wooden-cases*, made like *Coffins*, (but not contracted at the extremes, nor lidded) of what length and breadth you think best, but not above a foot in depth; let these be Dovetail'd, with wooden handles at each end, to lift in and out, and lastly, board full of auger-holes at the bottoms: Your *Cases* thus fitted, fill them with proper Mold, such as you would sow *Melon-seeds* in, or any other rare Seed, and thus place them in your bed of *dung*. The heat will pass kindly through the perforations, and continue a cherishing warmth five times as long as by the common way of *Hot-bed*, and prevent you the trouble of making new and fresh, for the whole process of the *Melon*, or what other of choicer Plants, require more than one removal: The heat of this bed continues eight or ten weeks without need of repairing, and if it should, 'tis but casting in some fresh-made soil and *litter*, beneath, and about your *Cases*, of which some you may glaze *Cheveron-wise* at the top, and with *spiracles* or casements, to refresh, and give them Air and Sun at pleasure. And these *Beds*, where you cannot conveniently sink them for want of depth, because of water, you may build above ground as well; and you may, or may not extend a Tent over it, to protect it from Rain, Wind and Sun, according as you find occasion. But thus have you a neat and useful *hot-bed*, as I have been taught to make it by the Right Honourable, the late Lord *Vicount Mordant at Parsons Green*, whose industry and knowledge in all hortulan Elegancies requires honourable mention. Note, that ordinary fresh mold, so it be not poor, and very lean or apt to clog, is a better surface for the *Hot-bed*, and to entertain and cherish the most curious *seeds*, than what *Gardeners* universally make use of, *stokie* and *over-loose*, at least let a due proportion of natural Earth be fitted amongst it.

And now at last I am come to set down the several ways of preparing *Composts* of *Dung*, and those other ingredients we have mention'd, and begin with the rudest, as that which best accommodates to the grosser part of Husbandry (which yet requires a special maturation) and so descend to the more refin'd: And these I distinguish into the *moist*, the *dry*, and the *liquid* for *Irrigation*. But first, here by the way greatly to be reprov'd is the heaping of a deal of indigested soil, and other trash, expos'd (as commonly we find it) to the heat of the *sun*, continual *ruins*, and drying *winds*, as it lies in the wide field, without the least coverture or shade; by which means, all the virtue is drawn forth and carried

carried away, leaving little more than a dry and insipid congection of *Caput Mortuum*, and perhaps a florid green Circle, or *Fairy dance* at the bottom, which the impregnated rains have enrich'd with what it has walsh'd from the heap; wherefore to prevent this, and make one load of our prepared Soil worth ten of it:

Cut a square, or oblong *pit* of thirty or forty foot in length, at the least four foot in depth, and ten foot over, or of what dimensions you think will suffice to furnish you with store: Let one of the sides or edges be made so sloping as to receive a Cart or Wheelbarrow to load and unload easily; let the bottom and sides also be so well pav'd, or laid with a bed of small *Chalk*, *Clay*, or the like, that it may be capable of retaining water like a *Cistern*: If to this you can commodiously direct any channels or gutters from your *Stable*, and other sinks about the house, it will be much the better. The *Pit* thus prepar'd, and under covert (for that I should have premis'd) so as at least the down-right rains may not fall upon it; cast into it first your *Stable soil* with the *Litter*, a foot or more thick, according to the depth of your *Pit*; upon this lay a bed of *fine Mold*, on that another bed of *Cider Marc*, *rotten fruit*, and *Garden offall*; on this a couch of *Pigeons* and *Poultry-dung*, with more *litter*; then a stratum of *Sheeps-dung*, a layer of *Earth again*, then *Neats-dung*; lastly, *Asbes*, *Soot*, *Fern*, (a moist and a dry) bottom of *Wood-stack*, *Saw-dust*, dry scowrings of *Ponds* and *Ditches*, with all other ingredients, as you happen to amass them, till the *Cistern* be full and heaped up; upon all this cast plentiful *water* from time to time, which if you can have out of some *Pond* where *Cattel* use to drink and cool themselves in, it will be excellent: At the expiration of two years you may confidently open your *magazine*, and separate the Layers as they rise, to cast them into other small *Pits* or receptacles made a little concave to receive them; where you may stir, air, mingle and work them in with fresh *Mold*, or one with the other, as you find cause; till they become comparatively sweet and agreeable to the scent: Lastly, you may pass them through a *screen* made of *lathes* plac'd at moderate intervals, and with the liquor remaining in your great *Cistern* sprinkle the several *Composts*, and make them up for use, casting the course remaining stuff, which would not pass the *riddle*, into the *Cistern* again for farther mortification, and so keep your *Pit* fill'd with fresh materials from time to time after the same method.

There are some who advise us to suffer your mixture to remain till it be quite dry, after it is thus refin'd, and then being beaten to dust, to strew it upon the ground. And indeed this seems in *Pliny's* time to have been the Custom; nor do I contradict it; provided you could water it, or were sure of a shower before the *sun* had drank too deeply of the spirit and vigour of it, which, reduc'd in this manner, it does easily part withal.

Now the Reason of our thus treating *Compost* of various soils and substances, is not only to dulcifie, sweeten, and free them from the noxious qualities they otherwise retain, and consequently im-

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part, apply'd, as usually we find them, crude, indigested and unactive; but for being immoderately hot and burning, or else rank, and apter to ingender *vermine*, *weeds* and *fungous* excrescences, than to produce wholesome *Plants*, *Fruits* and *Roots* fit for the Table, and grateful to the Palate; for which effect, it should be thoroughly concocted, air'd, of a scent agreeable, and reduc'd to the next disposition of a sweet and natural *Earth*, short and tractable, yet not so macerated as to lose any of its virtue. The proper season therefore for this work, is the beginning of the Autumnal *Equinox*, and *wind* westerly, both to prepare and lay it on your Land; that, whether it be of wet or dry consistance, it may have a gentle soaking into the *Earth*. As for fresh *Dungs*, such as *sheep* make when they are folded, it is good advice to cover it with *Mold* as soon as possible, before the *sun* have over-dry'd it, for the Reasons before hinted; and by this early application you will find all that is stiff and yet any ways contumacious, subdu'd, and perfectly prepar'd before you turn it in. If you would meliorate Ground for *Fruit-trees*, *Roots* and *Elements* of the *Orchards* and *Olitory Garden*, be cautious, that the hotter *Dungs* approach not immediately to their stems or roots, without such a circumposition of natural *Mold* as we have commended. But this is a note for such as think fit to use the soil *steaming* as it comes from the heap; but if it be prepar'd as we have shew'd, there is no danger even of immediate contact: And the same is to be observ'd in *Abolagation*, where we find cause to bare the *Roots* of *Trees*, and expose them to the air, for fresh influence, or to abate exuberances; and that the cavity be not fill'd all at once (when we conceive the *Roots* have been sufficiently air'd) but gradually from month to month, as from *October* till the beginning of *March*; and upon other occasions, leaving the surface rough, rather than too *compt*, and exquisitely trim'd, if only you dig your Ground; which once in two or three years, four or five, (as you perceive your *Trees* to require Culture,) is advisable, and then to mingle the *Earth* with a thorow soiling, and refresh it with the impregnate water of your *Cistern*, will exceedingly recover a worn-out Plantation. This *Irrigation* may also be yearly given to the *Roots* of your *Fruit-trees* about *June* and *July*; and the spreading of a little good Soil upon the surface, and rough chopping it in with the spade before winter, is good husbandry, to walk in amongst the *Roots*, and to draw them upwards, the shallow running of which is of so great importance.

And thus having shew'd how to prepare, ripen, separate and apply the several *Composts* (which for distinction sake we call the *dry mixture*;) I am next to describe the *liquid* in many particulars, not much differing from the former Process.

Twixt *East* and *North* erect a *Pergola* or *Shed*, so contriv'd with a cover, as to exclude or admit the *rain*, *snows* and weather at pleasure; sink a *Pit* for the *Cistern* as you did the former under it; cast into it all the *acid* *Plants*, bitter and rank *weeds* that come in your way, and grow in the neglected corners of your grounds, such

such as *Efula*, *Hemlock*, *Docks*, *Thistles*, *Fumary*, *Tabaco-stalks*, *Wormwood*, *Cabbage-leaves* and *stalks*, *Aconites*, the leaves, trash, and offal, such as Cattel will not touch; to these add *Pigeons* and *Poultry dung*, with their *Quills* and *Feathers*; any sort of *Ashes*, *Soot*, *Hogs-hair*, *Horn*, *hard bones*, such as the *dogs* have gnawn; also *Urine*, *Blood*, *Garbage*, *Pickle*, *Brine*, *Sea-water*, (if conveniently to be had,) otherwife Pond-water, to sprinkle it with, and keep it moist to accelerate putrefaction; but when all is well consum'd, forbear the pouring on of insipid liquors, and thus leave it till it be dry; then air, mingle and work your *Compost* as you were directed above, or boil it into *Peter*, casting what you find not well digested into the *Cistern* again for another year, and with a little addition, it will give you half the quantity of the former, and provided that you supply the *Magazine*, a continu'd and farther increase. Indeed this *Salt* and *Compost* is not immediately fit for use, till it be well dulcified and purg'd from its over acrimony, therefore mix it well with your *Mold*, and dilute it as you see cause. The *Receipt* is set down by old *Glauber* for the effecting of wonderful *Vegetation*, by the assistance of certain *Circulatory Vessels* to prepare the *Oyle succus*, and pinguid Juice, which that Author teaches in his *Miraculum Mundi*, to extract not only out of these Materials, but out of *Turf*, *Wood* and *Stone* it self, by calcining and burning them in close, and reverberating furnaces, to which a *Tube*, adapted near the bottom, may convey the spirits into a *Recipient*, as he describes the Process. I mention this the rather, for the real effects which I have been told of this *Menstrue* from very good Testimony: And doubtless he who were skill'd to extract it in quantity (and to dulcifie, and qualifie it for use,) a true *spirituous Nitre* may do abundantly more, in the way of the improvements we have celebrated, with a small quantity, than with whole loads, nay, hundreds of loads of the best and richest *dry Composts* which he can devise to make. But besides this, any house of *Ordure*, or rancid mold, strong *salts*, *vinous liquors*, *Urine*, *Ashes*, *Dust*, *shovelings* of the kennel and streets, &c. kept dry, and cover'd for three or four years, will be converted into *Peter*, without half this trouble; especially if you mingle it with the dung of *Pigeons*, *Poultry*, and other *salacious Fowl* which feed on *Corn*: Or those who would not be at the charge of distilling for these advantages, may make experiment of the so famous *Muck-water*, not long since cry'd up for the doing wonders in the field: Throw of the thickest and best *Marle* into your *Cistern*, exceedingly comminute and broken, which you may do with an iron Rake, or like Instrument, till the *Liquor* become very thick; cast on this the dung of *Fowl*, *Cotes*, *Sheep*, &c. frequently stirring it; to this add the soil of *Horses* and *Cows*, *Grains*, *Lees of Wine*, *Ale*, *Beer*, any sort of beverage, *broths*, *brine*, *fatty* and *greasy stuff* of the *Kitchen*; then cast in a quantity of *Lime*, or melting *Chalk*, of which there is a sort very unctuous; also *blood*, *urine*, &c. mixed with the water, and with this sprinkle your Ground at seasonable times, and when you have almost exhausted the *Cistern* of the liquid, mingle

gle the residue with the grosser *Compost* of your *Stable* and *Com-house*, and with layers of *Earth*, *Sand*, *Lime*, S.S.S. frequently moistned with uncrude water, the taking up of which you may much facilitate, by sinking a *Tub* or *Vessel* near the corner of the *Cistern*, and piercing it with large holes at the bottom and sides, by which means you may take it out so clean as to make use of it through a great *Syringe* or watering Engine, such as being us'd to extinguish fire, will exalt and let it fall by showers on the Ground, and is much the more natural way of irrigation, and dispatches the work.

This *Liquor* has the reputation also for infucation of *Corn*, and other Grain, to which some add a fine sifting of *Lime-dust* on it; and when that is dry, to repeat it with new infusions and siftings: But

There is yet a shorter *Process*, namely, the watering with *Fish-mongers-wash*, impregnated with the sweepings of *Ships* and *Vessels* trading for *salt*, adding to it the *blood* of the Slaughter-house, with *Lime*, as above; but this is also much too fierce for any present use, till it be perfectly diluted, which is a caution indispensably necessary, when ever you would apply such powerful affusions, lest it destroy and burn up, instead of curing and enriching. Another take as follows:

Rain-water of the *Equinox*, q. s. boil'd with store of *Neats dung*; till it be very strong of it, dissolve one pound of *Salt-Peter* in every pottle of water; whilst this is a little tepid, macerate your *Seeds* for twenty four hours, dry them gently, rather with a cloth than by the fire; sow in the barrenest *Earth*, or water Fruit-trees with it, for prodigious effects. Or thus:

Take two quarts of the same water, *Neats-dung*, as before, boil'd to the consumption of half, strain it, casting into the percolation two handfuls of *Bay-salt*, and of *Salt-Peter* ana. Another:

Take *Rain-water*, which has stood till putrified, add to it *Neats*, *Pigeon*, or *Sheeps-dung*, expose it for *Insolation* a week or ten days, then pass it through a coarse strainer, infuse more of the same soil, and let it stand in the *Sun* a week longer, strain it a second time, add to it *Common salt*, and a little *Oxer Gall*, &c. Another:

Take *quick Lime*, *Sheeps dung* at discretion, put into *Rain-water* four fingers eminent; to ten pints of this *Liquor*, add one of *Aqua-vitæ*, macerate your *Seeds*, or water with it any lean *Earth*; where you would plant, for wonderful effects.

Infuse three pound of the best *Indian Niter* in fifteen Gallons of water, irrigate your barren Mould; 'twas successfully try'd amongst *Tulips* and *Bulbs*, where the *Earth* should by no means (as we have said) be forc'd by *Compost*. But a gentler than either, is,

A dilution of *Milk* with *Rain-water*, sprinkl'd upon unselect *Lime*, first sifted on your beds, and so after every watering the *Lime* repeated.

These, with divers more which I might superadd, not taken and transcrib'd out of *Common Receipt-Books*; and such as pretend to *Secrets*, but most of them experimented, I thought fit to mention; that

that upon repetition of Tryals, the curious might satisfy themselves, and as they have opportunity improve them, whilst perhaps. as to *irrigations*, less exalted liquors were more natural. And what if Essays were made of Liquors per *Lixivium*, the Plant reduc'd to ashes; might it not be more connatural, since we find by more frequent tryal, that the burning of *strubble* before the Rains descend on it, impregnates ground by the dissolution of its spermatic salts? I only name the naked *Phlegm* of *Plants* diffus'd either to use alone, or extract the former salt; but I say, I only mention them for the curious to examine, and *ex abundanti*. For certainly (to return a little, and speak freely my thoughts concerning them) most exalted *Menstrues*, and (as they dignify them with a great name) *Essentiated Spirits*; I say, all hasty motions, and extraordinary fermentations, though indeed they may possibly give sudden rise, and seemingly exalt the present vigour of *Plants*, are as pernicious to them as *Brandy*, and hot-waters are to Men; and therefore wherever these *ardent* Spirits are apply'd, they should be pour'd at convenient distances from any part of the *Plant*, that the virtue may be convey'd through some better qualified medium. But when all is done, waters, moderately impregnated and imbodied with honest *Composts*, and set in the *Sun*, are more safe, and I think more natural: For, as the Learn'd Dr. *Sharrok* truly affirms, *Water* is, of its own Constitution alone, a soil to *Vegetables*, not only as the most genuine *Vehicle* of the riches which it imparts to *Plants*, through the several strainers, and by means of which all change and melioration is effected; but for that it is of all other substances best dispos'd for ingression, to insinuate into, and fertilize the *Earth*, which is the reason that floated and *irriguous* grounds are so pregnant. Besides, it is of all that pretend to it, nearest of *blood* (as I may say) to the whole *Vegetable* Family: For to assist with any confidence, what part of the *mother Earth* passes into their composition; or whether it serve (as we touch'd before) only for stability, or as a *Womb* and receptacle to their *Seeds* and *Eggs* (for so we are taught to call the *Seeds* of *Plants*.) I shall not undertake to discuss. Every body has heard of *Van-Helmonts* *Ash-tree*; and may without much difficulty repeat what has been experimented by exquisitely weighing the *Mold* before, and after a *Gourd* is planted in it, and till it be grown to bulk and full maturity, fed with water only; how much *liquor* is consum'd, and how little of the *Earth* consum'd, to make some conjecture; though I do not yet conceive the *Earth* to be altogether so dull and unactive, as to afford no other aid to the Generation of what she bears; the diversity of soils being (as we have shew'd in this Discourse) so infinitely various, and the difference of invisible infusions so beyond our *Arithmetic*. But if we give *Liquids* predominance, and at least the *Masculine* preference, be they *Salts*, or *Spirits* (that is, nitrous Spirits) convey'd into her bosom how they will; sure we are, that *Water* and *Vegetables* are much nearer of alliance, than either *Water* or *Air* are with the *Earth* and *Mold*. But neither do I here also by any means exclude the *Air*, nor deny its perpetual Commerce,

merce, and benign influences, charg'd as it comes with those pregnant and subtil particles, which insinuating into the *Earths* more steady, and less volatile *Salts*, and both together invading the *sulphur* (and freeing them from whatsoever they find contumacious) that intestine fermentation is begun and promoted, which derives life, and growth, and motion to all that the produces. That by the *Air*, the most effete and elixiriated *Mold* comes to be repair'd, and is qualified to attract the prolific nitrous spirits, (which not only disposes the *Earth* to this impregnating magnetism, but converts her more unactive and fixed salts into quite another genius and nature,) the Learned Doctor *Mayow* has ingeniously made out; and all this by a naked exposure to the *Air* alone, without which it produces nothing: Nor can *Plants* (totally excluded from the *Air*) live, or so much as erect themselves to any thriving purpose, as being depriv'd of that *breath* and vital *Balm*, which no less contributes to their growth and nourishment, than does the *Earth* it self with all our assistances: For that *Plants* do more than obscurely respire, and exercise a kind of *Peristaltic* motion, I little doubt, from the wonderful and conspicuous attraction, and emission, which some of them discover; particularly, the *Aloes*, and other *Sedums*, and such as consisting of less cold and viscous parts, send forth their *Aromatic* wafts at considerable distance.

Besides, we find that *Air* is nearer of kin and affinity to *Water*, than water is to *Plants*; unless I should affirm, that *Air* it self were but a thinner water; for how else are those *Vines*, and other *Trees* of prodigious growth, maintained amongst the barren *Rocks*, and thirsty *Pumices*, where *Rains* but seldom fall? if not from this *rorid* *Air*. Not to insist again, that perhaps even these *Rocks* themselves may once have sprung from liquid Parents; and how little, even such as are expos'd to continual showers in other *Climates*, abate of their magnitude, since we rather find them to increase; and that also the *Fruits* and *Juices* of *Vegetables* seem to be but the concretions of better concocted *Water*, and may not only be converted into *lignous* and woody substance (as the Learned Doctor *Beale* has somewhere instanc'd in a Discourse presented to You, and Recorded in the *Public Transactions*;) but is apt enough to petrify and become arrant Stone.

Whatever then it be which the *Earth* contributes, or whether it contain universally a *Seminal* virtue, so specified by the *Air*, Influences, and *Genius* of the *Climax*, as to make that a *Cinnamon*-Tree in *Ceylon*, which is but a *Bay* in *England*, is past my skill to determine; but 'tis to be observed with no little wonder, what *Monsieur Bernier* in his History of the *Empire* of the *Mogol* affirms to us of a mountain there, which being on one side of it intolerably hot, produces *Indian Plants*; and on the other, as intemperately cold, *European* and *Vulgar*. Not here to pass without notice at least, what even the most exhausted *Mold* will (to all appearance) produce spontaneously, when once it has been well expos'd to the *Air*, and heavenly influences; if what springs up be

not possibly from some *volatil* rudiments and seeds, transported by *winds*, higher than we usually place our Experiments, unless we could fix them upon *Olympus* top: But *Porta* tells us with more confidence that he took *Earth* from a most profound and dry place, and expos'd it on such an eminence, as to be out of reach even of the *winds*; but it produc'd, it seems, only such *Plants* as grew about *Naples*, and therefore may be suspected.

To return then again from this digression, and pursue our *Liquids*; where there is good *Water*, there is commonly good *Earth*, and *vice versa*; because it bridle and tempers the *Salts*, abates the *acidity* and fierceness of *Spirits*, and imparts that useful ligature and connexion to the Mold, without which it were of no use for *Vegetation*. In the mean time, of all *Waters*, that which descends from Heaven, we find to be the richest, and properest in our work, as having been already *meteoriz'd*, and circulated in that great *digestory*, enrich'd and impregnated with *astral* influences from above at those propitious Seasons; whence that saying, *Annus fructificat, non Tellus*, has just Title to a Truth we every years Revolution behold and admire, when the sweet *Dews* of *Spring* and *Autumn* (hitherto confipated by *cold*, or consumed with too much *heat*) begin to be loosened, or moderately condens'd, by the more benign temper of the *Air*, impregnating the prepared *Earth* to receive the *Nitrons* Spirits, descending with their baulmy pearls, yet with such difference of more or less benign, (as vapours haply, which the *Earth* sends up, may be sometimes qualified,) that nothing is more uncertain. And this we easily observe from the Labours of the Industrious *Bee*, and her precious *Elixir*, when for some whole months she gathers little, and at other times sives her waxen *City* with the harvest of a few propitious days. But I am gone too far, and therefore now shall set down only a few directions concerning *watering*, and so dismiss the Subject and your patience.

1. It is not good to water new-sown *Seeds* immediately, as frequently we do, and which commonly bursts them; but to let them remain eight and forty hours in their beds, till they be a little glutted with the natural juice of the *Earth*: But then neither must you so neglect their *Beds*, as to become totally dry; for if once the *Seeds* crack through heat, their little *Souls* exhale; therefore till they creep, you must ever keep them in a just temper for moisture, and be sure to purge them of predacious *Weeds* betimes: In a word, these *irrigations* are to be conducted according to the quality of the *Seeds*, those of hard *integuments* requiring more plentiful refreshings.

2. Never give much *water* at one time; for the surface of the *Earth* will often seem very dry, when 'tis wet enough beneath; and then the *Fibers* rot about *Autumn*, especially in *Pots* and *Cases*, winter'd in the *Green-house*: To be the more secure, we have already caution'd *Gardeners* to keep their bottoms hollow, that nothing stagnate and fix too long; which should be but transitory. If such curiosities strike no root by *September*, the leaves desert them certainly

certainly at *Spring*: The reason is want of *Air*, not moisture. Therefore in all intervals of severer *Frosts*, and rigorous winter-weather, be sparing of refreshings, and unless you perceive their leaves to crumple up, and fall, (which is their language for *Drink*;) give them as sparingly as you can. Indeed, during the *Summer*, and when they are expos'd, they require almost perpetual irrigation, and that the liquor be well impregnated with proper Compost: It is ever advisable to *Water* whilst the Ground is a little moist, and not totally dry; especially during the growing seasons, for it *stunts* the *Plant*, and intercepts its progress. But in hard *Frosts*, or *Foggy* Seasons, watering your housed Plants indangers them by multitudes, and a certain *Mill-dew* which they contract. On the other hand

Applications too dry create an intemperate thirstiness, and then they drink unmeasurably, and fall into *Droppers*, *Jamdiars*, *Fedvers*, swell, languish and rot; and if the liquor prove too crude (as commonly it does, if taken from running, and hungry fountains) it extinguishes the natural heat, and obstructs the *Pores*; and therefore when ever you are constrain'd to make use of such drink, expose it first to the warm sun for better concoction, infusing *Sheep*, *Pigeons*, or *Neats-dung*, to give it body: But though *Spring-water* be so bad, slow running *River* is often very good, and *Pond-water* excellent, so it be sweet; but all stinking pools, *mineral* and *bituminous* waters, are not for our use; and often good *Air* is as tedious as good water; *Worms*, *Mouldworts*, *Cankers*, *Consumptions* and other *Disorders*, being the usual and fatal consequence of these vices.

If you be to plant in fresh and new broken-up *Earth*, and that the season or mold be too dry, 'tis to be *water'd*; but then give it a competent sprinkling, or sifting of dry and fine mold upon what you have refresh'd, and then beating it a little close with the back of your *spade*, plant it successfully; for this you will find to be much better, than to *water* it after you have planted (as the custom is) and as you may observe in setting *Violets*, *Auriculas*, *Primroses*, and other *Capillaries*, planted in beds or borders, and then dash'd with a flood of *water*, which, so soon as the *Sun* has look'd upon, resign and lose their tinctures, scorch and shrivel up: Hence therefore let *Gardeners* be cautious how they expose their *Exotics*, and choicer *Case-Plants*, which many times having born the *Winter* bravely in the *Conservatory*, dwindle away, and are lost on the sudden; by being too suddenly plac'd in the Eye of the *Sun* in *March*, (or later) when they most of all require the protection of a thin *Hedge*, or *Canvas Curtain*, to break his scorching darts, as well as defend them from our then too constant and rigorous *Etesians*. Lastly,

For the *Season* likewise of this work, let it be towards the *Evening* in hot and *Summer* days, for the reason immediately assign'd; for the moisture being in a short time drunk up, deserts the *Plant* to the burning *Planet*; and hence it is, that *Summer mists* are so noxious, and *Meridian watrings*; and therefore the best expedient

pedient is, upon such exigencies, to pour your refreshings rather all over the *Area* on which your *Cases* of choice and rare shrubs are plac'd, and among the *Allees* and *Paths* between your *Beds of Flowers*, for the raising artificial *Dews*, (by which is unfolded no common secret;) or water them *per lingulam*, and *guttatim*, than either with the *Pot* or *Bucket*: And after this manner, if at other seasons they stand in need of heat and comfort of warmth, by strewing *sand* or *Cinders* on the same intervals, the section will recreate them, upon allemissions of the Sun-beams.

As for grosser *Plantations*, and *Trees* of old *Orchard-Fruits*, moderation is also to be observed, and not to dish on such a quantity near the *stem* and *body*; but first with the *pade* to loosen the *Earth* about them, especially towards the extremities of the tenderest *Roots*, which generally sprout at the ends of the most woody, whose mouths are shut with tougher bark. They therefore may be cut sloping to quicken them a little, and make them strike fresh *fibers*; especially, if some rich, and tempting mold be seasonably apply'd: For *Trees* will (as we shew'd) with very little *Earth* to cover them, take fast root, (provided you stablish them against impetuous winds, shocks and accidents of force,) and thrive exceedingly with this refreshment.

Some make pretty large *holes* with an *Iron-Crow*, or (which is better) a pointed *stake*, and pour the *liquor* in at those overtures; but besides, that by this means they wound the roots, (which *gargenes*, and sometimes kills the *Tree*,) if the holes be not fill'd, the *Air* and *Moisture* moldies them: So as, when all is summ'd together, there's nothing comparable to frequent *stirring* up the *Ground*, opening the dry clod, and *matring* upon that; and if you lay any *fearn-brakes* or other trash about them, capp'd with a little *Earth*, to entertain the moisture, and skreen it from the heat, let it not be wadded so close, or suffer'd to lie so long, as to contract any mustiness, but rather loose and easie, that the *Air* may have free intercourse, and to break the more intense ardours of the scorching Sun-beams.

Thus I have exercis'd Your *Lordships* and these noble *Gentlemen's* Patience with a dull Discourse of *Earth*, *Mold*, and *Soil*; but, I trust, not altogether without some *Fruit*; or, at least, not improperly *pro hic & nunc*, as the Subject has Relation to what has so lately been produc'd, and with happy event made out, by those Learned Persons, who have entertain'd this illustrious Society with the *Anatomy of Plants*.

POMONA,

POMONA,

OR AN

APPENDIX

CONCERNING

FRUIT-TREES,

In relation to

CIDER,

The *Making*, and several ways of *Ordering* it.

The Third Edition with Addition.

Virg. Eclog. ix.

— Carpent tua Poma nepotes.

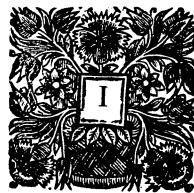


L O N D O N,

Printed for *John Martyn*, Printer to the *Royal Society*.
M DC LXXXVIII.

TO THE
RIGHT HONOURABLE
THOMAS
Earl of *SOVTHAMPTON*,
Lord HIGH TREASURER
OF
ENGLAND, &c.

My Lord,



If great *Examples* did not support it, the dignity and greatness of your *Person* would soon have given cheque to this presumption: But since *Emperours* and *Kings* have not only gratefully accepted *Works* of this nature, but honor'd them likewise with their own sacred hands, that *Name* of yours, (which ought indeed never to appear but on Instruments of *State* and fronts of *Marble*, consecrating your *Wisdom* and *Vertues* to *Eternity*) will be no way lessen'd by giving Patronage to these appendent *Rusticities*. It is from the Protection and Cherishment of such as your *Lordship* is, that these *Endeavours* of ours may hope one day to succeed and be prosperous. The noblest and most useful Structures have laid their Foundations in the *Earth*: if that prove firm here (and firm I pronounce it to be, if your *Lordship* favour it) We shall go on and flourish. I speak now in relation to the *Royal Society*, not my self, who am but a *Servant* of it only and a *Pioneer* in the *Works*. But be its fate what it will, Your *Lordship*, who is a *Builder*,
X x and

The Epistle Dedicatory.

and a lover of all *Magnificences*, cannot be displeas'd at these agreeable Accessories of *Planting*, and of *Gard'ning*. But, my Lord, I pretend by it yet some farther service to the State than that of merely profit, if in contributing to your divertisement I provide for the *Publick health*, which is so precious and necessary to it in your excellent *Person*. Vouchsafe *P O M O N A* your *Lordships* hand to kiss, and the humble *Presenter* of these *Papers* the honour of being esteem'd,

My Lord,

YOUR most humble,
and most obedient
Servant,

J. EVELYN.

POMONA,

P O M O N A,

Or An Appendix Concerning

FRUIT-TREES,

In relation to

C I D E R:

The Making, and several ways of Ordering it.

THE PREFACE.



AT Quercus was the Proverb; and it is now time to walk out of the Woods into the Fields a little, and to consider what Advancement may be there likewise made by the planting of FRUIT-TREES. For after the Earth is duly cultivated, and pregnant with a Crop of Grain; it is only by the Furniture of such Trees as bear Fruit, that it becomes capable of any farther Improvement. If then by discovering how this may best be effected, I can but raise a worthy emulation in our Country-men; this addition of noble Ornament, as well as of Wealth and Pleasure, Food and Wine, may (I presume) obtain some grateful admittance amongst all Promoters of hortulan Industry.

But before I proceed, I must, and do ingenuously acknowledge, that I present my Reader here with very little of my own, save the pains of collecting and digesting a few dispers'd Notes (but such as are to me exceedingly precious) which I have receiv'd, some from worthy, and most experienc'd * Friends of mine; and others, from the well-furnish'd Registers, and Cimelia of the ROYAL SOCIETY. Especially, those Aphorisms, and Treatises relating to the History of Cider, which by express commands they have been pleas'd to injoin I should publish with my Sylva.

It is little more than an Age, since Hops (rather a Medical, than Alimental Vegetable) transmuted our wholesome Ale into Beer; which doubtless much altered our Constitutions: That one Ingredient (by some not unworthily suspected) preserving Drink indeed, and so by custom made agreeable; yet repaying the pleasure with tormenting Diseases, and a shorter life, may deservedly

ly abate our fondness to it; especially, if with this be consider'd likewise, the casualties in planting it, as seldom succeeding more than once in three years; yet requiring constant charge and culture; Besides that it is none of the least devourers of young Timber.

And what if a like care, or indeed one quarter of it, were (for the future) converted to the propagation of Fruit-trees, in all parts of this Nation, as it is already in some, for the benefit of Cider? (one Shire alone within twenty miles compass, making no less, yearly, than Fifty thousand Hogheads) the commutation would (I persuade my self) rob us of no great Advantage; but present us with one of the most delicious and wholesome Beverages in the World.

It was by the plain Industry of one Harris (a Fruiterer to King Henry the Eighth) that the Fields, and Environs of about thirty Towns, in Kent only, were planted with Fruit, to the universal benefit, and general Improvement of that County to this day; as by the noble example of my Lord Scudamor, and of some other publick-spirited Gentlemen in those parts, all Herefordshire is become, in a manner, but one intire Orchard: And when his Majesty shall once be pleas'd, to command the Planting but of some Acres, for the best Cider-fruit, at every of his Royal Mansions amongst other of his most laudable Magnificences; Noblemen, wealthy Purchasers, and Citizens will (doubtless) follow the Example, till the preference of Cider (wholesome, and more natural Drinks) do quite vanquish Hopps, and banish all other Drogues of that nature.

But this Improvement (say some) would be generally obstructed by the Tenant, and High-shoon-men, who are all for the present profit; their expectations seldom holding out above a year or two at most.

To this 'tis answer'd; That therefore should the Lord of the Mannour not only encourage the Work by his own Example, and by the Applause of such Tenants as can be courted to delight in these kinds of Improvements; but should also oblige them by Covenants to plant certain Proportions of them, and to preserve them being planted.

To fortifie this profitable Design, It were farther to be desir'd, that (if already there be not effectual provision for it, which wants only due execution and quickning) an Act of Parliament might be procur'd for the setting but of two, or three Trees in every Acre of Land that shall hereafter be enclosed, under the Forfeiture of Six pence per Tree, for some publick and charitable Work, to be lay'd on the Defaulters. To what an innumerable multitude would this, in few years, insensibly mount; affording infinite proportions, and variety of Fruit throughout the Nation, which now takes a Potion for a refreshment, and drinks its very Bread-corn!

I have seen a Calculation of twenty Fruit-trees to every Five-pennas of yearly Rent; forty to Ten; sixty to Fifteen; eighty to Twenty;

Twenty; and so according to the proportion. Had all our Commons, and Wast-lands one Fruit-tree but at every hundred foot distance, planted, and senc'd at the publick charge, for the benefit of the Poor, whatever might dye and miscarry, enough would escape able to maintain a Stock, which would afford them a most incredible relief. And the Hedge-rows, and the Champion-grounds, Land-divisions, Mounds, and Head-lands (where the Plough not coming, 'tis ever abandon'd to Weeds and Briars) would add yet considerably to these Advantages, without detriment to any man.

As touching the Species, if much have been said to the preference of the Red-strake before other Cider-Apples, this is to be added; That as the best Vines, of richest liquor, and greatest burthen, do not spend much in wood and unprofitable branches; so nor does this Tree: for though other Cider may seem more pleasant (since we decline to give Judgment of what is unknown to us) we yet attain our purpose, if This shall appear best to reward the Planter, of any in present practice; especially, for the generality; because it will fit the most parts which are addic'd to these Liquors, but miss of the right kinds, and prove the most secure from external injuries and Invaders. But to give Cider its true estimation; besides that it costs no Fuel to Brew it, and that the labour is but once a year; it is good of a Thousand kinds, proper for the Cure of many Diseases, a kind Vehicle for any sanative Vegetable, or other Medical ingredients; That of Pepins a Specific for the Consumption; and generally, all strong, and pleasant Cider excites and cleanses the Stomach, strengthens Digestion, and Infallibly frees the Kidnies and Bladder from breeding the Gravel and Stone; especially if it be of the genuine Irchin-field Red-Strake; not omitting how excellently it holds out good many years to Improvement if full-body'd, and strong even in the largest and most capacious Vessels; so as when for Ordinary Drink our Citizens, and honest Country-men shall come to drink it moderately diluted (as now they do six-shilling Beer in London and other places) they will find it marvellously conduce to health; and labouring people, where it is so drunk, affirm, that they are more strengthened for hard Work by such Cider, than by very best Beer.

But not to refine any farther upon the rare effects of Cider, which is above all the most eminent, soberly to exhilarate the Spirits of us Hypochondriacal Islanders, and by a specific quality to chase away that unsociable Spleen, without excess; we must not forget that the very Blossom of the Fruit perfumes, and purifies the ambient Air, which (as Dr. Beal well observes in his Herefordshire Orchards) is conceiv'd conduces so much to the constant Health and Longevity, for which that Country has been always celebrated, fencing their Habitations and sweet Receses from Winds, and Winter-invasions, the heat of the Sun, and his unufferable darts: And if (saith he) we may acknowledge grateful trifles, for here retain'd without the charge of Italian wires: To which I cannot

Herefordshire
Orch. p. 8.

cannot but add his following option, That if at any time we are in danger of being hindered from Trade in Foreign Countries, our English indignation may scorn to feed at their Tables, to drink of their Liquors, or otherwise to borrow or buy of Them, or of any their Confederates, so long as our Native Soil does supply us with such excellent Necessaries; and whether this be not prophetically seasonable in the present conjuncture I leave wise men to consider.

Nor do we produce these Instances to redeem the Liquor from the superstition, prejudice, and opinions of those Men who so much magnify the juice of the Grape above it: But we will here add some Experiments from undeniable success (in spite of Vintners, and Bawds to mens Palates) were they sufficient to convince us, and reclaim the vitiated; or that it were possible to dispute of the pleasantness, riches, and precedence of Drinks and Diets, and so to provide for fit, competent, and impartial Judges; when by Nature, Nation, or Climate (as well as by Custom and Education) we differ in those Extreams.

Most parts of Africa and Asia prefer Coffee before our Noblest Liquors; India, the Roots and Plants before our best Cook'd Venison; Almost all the World crude water, before our Country Ale and Beer; and we English being generally more for insipid, luscious, or gross Diet, than for the spicy, poignant, oylie, and highly relish'd, (witness our universal hatred of Oyls, French-wine, or Rhenish without Sugar; our doating on Currans, Figs, Plum-pottage, Pies, Pudding, Cake, &c.) renders yet the difficulty more arduous. But to make good the Experiment.

About thirty years since one Mr. Taylor (a person well known in Herefordshire) challeng'd a London-Vintner (finding him in the Country) That he would produce a Cider which should excel his best Spanish or French-wine: The Wager being deposited, He brings in a good Red strake to a private House: On that Scene, all the Vintner could call to be Judges pronounce against his Wine; Nor would any man there drink French-wine (without the help of Sugar) nor endure Sack for a full draught; and to those who were not accustomed to either, the more racy Canaries were no more agreeable than Malaga, too luscious for the repetition. But this Wager being lost, our Vintner renews his Chappel, upon these express terms, of Competent and Indifferent Arbitrators. The Gentleman agrees to the Articles; and thus again after mutual engagements it must be debated who were Competent Judges, and absolutely Indifferent. Mr. Taylor proposes Three, whereof the odd Number should by Vote determine: They must be of the fittest Ages too, or rather the fittest of all Ages, and such as were inn'd neither to Cider nor any Wine; and so it was agreed. The Judges convene; viz. A Youth of ten years old, a Man of thirty, and a Third of sixty; and by All these also our Vintner lost the Battel. But this is not enough; 'Tis assay'd again by Nine Judges, the Ternary thrice over; and there 'tis lost also: To this we could add another, even of the Cider of Ledbury (which is not yet the best of Herefordshire) which, when an experienced London-Vintner had tasted, he

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wish'd had been Poyson; for that if it were known where he dwelt, it would utterly undo his Trade. And here I will conclude; for I think never was fairer Duel; nor can more be reasonably pretended to vindicate this Blessing of God, and our Native Liquor from their contempt, and to engage our Propagators of it.

To sum up all: If Health be more precious than Opinion, I wish our Admirers of Wines, to the prejudice of Cider, behold but the Cheat themselves; the Sophistications, Transformations Transmutations, Adulterations, Balfardizings, Brewings, Trickings, not to say, even Arsenical Compassings of the sophisticated God they adore; and that they had as true an Inspection into those Arcana Lucifera, which the Priests of his Temples (our Vintners in their Taverns) do practise; and then let them drink freely that will; Αεισαν υγι υδωρ: — Give me good Cider.

It is noted in our Aphorisms how much this Beverage was esteemed by His late Majesty, and Court, and there refer'd to all the Gentry of the adjoining Country, (no strangers to the best Wines) when for several Summers in the City of Hereford (so encompass'd with store of it, and brought thither without charge, or extraordinary subductions) it was sold for six-pence the Wine-Quart, not for the scarcity, but the excellency of it: And for the Red-strake, that it has been seen there hundreds of times (with vehemence and engaged competition) compar'd with the Cider of other the most celebrated Fruit, when after a while of vapour, no man insisted for any other Liquor in comparison.

But it is from these Instances (may some say) when the World shall have multiplied Cider-Trees, that it will be time enough to give Instructions for the right Pressing and Preserving of the Liquor. The Objection is fair: But there are already more Persons better furnish'd with Fruit, than with Directions how to use it as they should; when in plentiful years so much Cider is impair'd by the ignorant handling, and becomes dead and sour, that many even surfeit with the Blessing; it being rarely seen in most Countries, that any remains good, to supply the defects of another year; and the Royal Society would prevent all this hazard by this free Anticipation. And yet when all this is said, we undertake not to divine what excellent Cider other soils may bear; nor do we positively extol the Red-strake farther than the bounds and confines of Herefordshire, for the Experiments we have produc'd; but because there are doubtless many such soils sparsely throughout this Nation; why should it not incite our Industry to its utmost effort, and the commendable emulation of endeavouring to raise a yet kindlier Cider-fruit if it be possible, and which may prove in itself as good, and as agreeable to the Soil where we plant it? And certainly, much of this may fairly be expected, from the Trials, Culture, and Propagation of Kernel-fruits of innumerable sorts, and from hopeful Wildings, and the peculiarity of Grounds: I find that even in the West-Indies, at our Plantations of New England, one Gentleman in Connecticut Colony, made 500 Hogheads of Cider in one year out of his own Orchard, and that though it be in great plenty among

mong them, yet it is sold for ten Shillings the Hoghead.

It now remains, that I should make some Apology for my self, to extenuate the tumultuary Method of the ensuing Periods. Indeed it was not intended for a quaint or elaborate piece of Art; nor is it the design of the Royal Society to accumulate Repetitions when they can be avoided; and therefore in an Argument so much beaten as is that of dressing the Seminary, Planting, and modes of Graffing, it has been with Industry avoided; such rude, and imperfect draughts being far better in their esteem (and according to my Lord Bacon's) than such as are adorn'd with more pomp, and ostentous circumstances, for a pretence to Perfection. The Time may come when the richness, and fullness of their Collections may worthily invite some more Industrious Person to accomplish that History of Agriculture, of which these Pieces (like the limbs of Hippolytus) are but scattered parts: And it is their greatest ambition for the Publique Good, to provide such Materials, as may serve to Raise, and Beautifie that most desirable Structure.

EVELYN.

POMONA.

POMONA.

CHAP. I.

Of the Seminary.

WE had not the least intention to enlarge upon this Title, after we had well reflected on the many and accurate Directions which are already published, as well in our French-Gardiner, as in sundry other Treatises of that nature, had not a most worthy Member of the Royal Society (to whom we have infinite Obligations) furnished us with some things very particular and remarkable, in order to the improvement of our Seminaries, Stocks, &c. which are indeed the very Basis and Foundation of Cider-Orchards. It is from those precious papers of his, and of some others (whose Observations also have richly contributed to this Enterprize) that we shall chiefly entertain our Planter in most of the following Periods.

Whosoever expects from the kernel of a rich or peculiar Apple or Pear to raise Fruit of the same kind, is likely to find many obstructions and disappointments: For the Wilding, (Crab or Pear) *Pomus sylvestris*, being at the best the natural product of the soundest kernel in the firmest land, and therefore the gust of the Fruit more strongly austere, fierce, and sharp, and also the Fruit less and more woody; and the pleasanter or plumper and larger Apple being the effect of some inteneration, which inclines to a kind of rebatement of the natural strength of the Tree; the best choice of kernels for Stock, indefinitely, (and on which we may graff what we please) should be from the soundest Wilding. For,

A kernel taken from any grafted Apple, as *Pepin*, *Pear-main*, &c. does most naturally propend to the wildness of the Stock on which 'twas inserted, as being the natural mother of the kernel, which is the very heart of the Apple; and also from a more deep and secret Reason, to be hereafter unfolded.

Apples and Pears requiring rather a vulgar and ordinary Field-land, than a rich Garden-mold, (as has been often seen to succeed by frequent Observations) it has been found that kernels sowed in a very high compost, and rank earth, have produced (large indeed, but) insipid Fruit, hastily rotting on the Trees, before all the parts of it were mature, and disposing to Cankers. *Vid. Aphor. 33.*

And sometimes when they seemed in outward figure to bear the shape of grafted Apples, from whence the kernels came, yet the gust did utterly deceive, wanting that vivacity and pungent agreeableness.

If the kernels of natural Apples (or of ungrafted Trees) should produce the same, or some other variety of Apples, (as sometimes it succeeds) yet would this care be seldom *operæ pretium*, and at best but a work of Chance, the disappointment falling out so often through the fickleness of the Soil: Or admit that the most proper and constant, yet would the very dew and rain by various and mutable Seasons, and even by the Air it self, (which operates beyond vulgar perception, in the very changes as well of the mold, as of the seeds and fruit) create almost infinite alterations: And

Y y the

Dr. Beale of
Yeovil in
Somersetshire.

the choice having been in all places (apparently for some *thousands* of years) by propagating the most delicate of *Fruits* by the *Grafts*, 'tis almost a desperate task to attempt the raising of the like, or better Fruit from the rudiments of the *Kernel*.

Yet since our design of relieving the want of *Wine*, by a *Successor* of *Cider*, (as lately improv'd) is a kind of *Modern Invention*, We may encourage and commend their patience and diligence who endeavour to raise several kinds of *Wildings* for the trial of that excellent *Liquor*; especially since by late experience we have found, that *Wildings* are the more proper *Cider-Fruits*; some of them growing more speedily, bearing sooner, more constantly, and in greater abundance in leaner Land, much fuller of *juice*, and that more masculine, and of a more *Winy* vigour.

Thus the famous *Red-frake* of *Herefordshire* is a pure *Wilding*, and within the memory of some now living firnamed the *Scudamores Crab*, and then not much known save in the *Neighbourhood*, &c. Yet now it would be difficult to shew that *Red-frake* which grew from a *kernel* in that whole *Tract*, all being since become *grafted* Trees. Thus 'tis also believed, That the *Bromsbury Crab* (which carries the fame in some parts of *Glocestershire*) and many of the *White Puffs*, and *Green Musts*, are originally *Savages*; as now in *Somersetshire* they have a generous *Cider* made of promiscuous *kernels*, or *ungrafted* Trees, which fills their confidence that no other *Cider* does exceed it; and 'tis indeed strong, and of a generous vigour.

Nor dare we positively deny, but that even the best of our *Table-fruit* came also originally from the *kernel*: For it is truly noted by my Lord Bacon, That the Fruit does generally obey the *Graft*, and yields very little to the *Stock*; yet some little it does.

The famous *Bezy'd Hery*, an excellent Musky *Pear*, was brought into the best *Orchards* of *France* from a *Forest* in *Bretany*, where it grew *wild*, and was but of late taken notice of.

But now to the deep *Reason* we lately threaten'd: We have by an Experiment found some near affinity between the *Kernel* of the *Apple* and the heart or interior of the *Stock*: For I saw (says Dr. Beale) an old rotten *Kernel-Tree* bearing a delicate Summer-fruit, yielding store of smooth *Cider*, ('tis call'd the French-*Kernel-Tree*, and is also a Dwarf, as is the *Red-frake*;) and examining divers *Kernels*, many years successively, of that hollow and decayed *Tree*, I found them always very small of growth, and empty, meer skins of *Kernels*, not unlike to the emaculated *Scrotum* of an *Eunuch*; another younger *Tree*, issuing from the sounder part of a *Root* of the same old *Tree*, had full and entire *Kernels*.

And from some such Observation might the production of *Berberies*, &c. without *stones*, be happily attempted; an *Instrument* fitted to take out the marrow or pith of the *Branches*, (as the same Dr. Beale perform'd it;) for from the numerical Bush of that *Fruit* he found some *Branches* produce *Berberies* that had no *stones*, others which had; and in searching for the cause of the effect, perceived, that the pith or heart was taken from the *radical*, or main *Branches*, as the other was full of pith, and consequently the fruit in perfection; of all which (he writes me word) he made several trials on other fruit, but left the place before he could see the event. But he adds;

These

Or, An Appendix concerning Fruit-Trees, &c.

These many years (almost twenty) I have yearly tri'd Kernels in Beds of clean Earth, Pots, and Pans, and by the very leaves (as they appear'd in first springing for one month) I could discern how far my Essays had civiliz'd 'em: The Wilder had shorter, stiffer, brown, or fox-colour'd leaves, The more ingenuous had more tender, more spreading leaves; and approaching the lighter verdure of the Berbery leaf when it first appears. He adds,

Some Apples are call'd Rose-Apples, Rosemary-Apples, Gilly-flower-Apples, Orange-Apples, with several other adjuncts, denominated them, from what Reason I know not. But if we intended to try such infusions upon the Kernels (as should endeavour to alter their kinds) we should not approve of the bedabbling them with such infusions, (for over-moisture would rather enervate than strengthen them) but rather prepare the Earth the year before, with such insuccations, and then hinder it from producing any Weeds, till ready for the Kernels, and then in dewy times, and more frequently when our Climate were surcharg'd with rain, cover the Beds and Pots with the small leaves of Rosemary, Gillyflowers, or others odoriferous Blossoms, and repeat it often, to the end the dew may meteorize, and emit their finer Spirits, &c. Or if any shall please to be so liberal of their Salts and Calcinations of peculiar Virtues (though possibly the Essay may endanger their seeds) yet the mixture of such Salts finely reduc'd and strewed discreetly on their Beds, may be a more probable means, than those Liquid Infusions which have hitherto been so confidently boasted. For thus also we are in this Age of ours provided of more vigorous Ingredients for trials than were known to the Ancients. Finally,

From what has been deduc'd from the Wilding of several parts, it may manifestly appear, how much more congenial some soil is than other, to yield the best Cider-fruit from the Kernel; and the hazle ground, or quicker mold warm and light, much better than the more obstinate clay or ranker earth, heavy, cold or wet: In hot Gravelly-grounds, where almost no sort of Fruit will grow, Pears will thrive; and a Friend of mine assures me, of One that clave a Rock, and filling it with a little good Earth, planted a Pear-tree therein, which prosper'd exceedingly; and at this time, in the Town not far from my dwelling, there is a Bonne Chrestienne Pear-tree plentifully bearing very goodly fruit which grows in a narrow Court pav'd with flint and pibbles, and unless a little in the morning, shaded from all the benign aspects. I add this, that none may go hence without encouragement.

C H A P. II.

Of Stocks.

THE former thus establish'd, after all *humours* and *varieties* have been sufficiently wearied, we shall find the *Wilding* to be the hardiest and most proper *Stock* for the most delicate *Fruit*: This confirm'd by *Varro*, lib. 1. cap. 40. *In quamcumq; arborem inferas*, &c. and 'tis with reason: However they do in *Heresfordshire*, both in practice, and opinion, limit this *Rule*; and to preserve the gust of any delicate *Apple* (as of the *Pear-main*, *Quince-Apple*, *Stockin*, &c.) rather graff upon a *Gennet-Moyle* or *Cyddoddin-Stock*, (as there called) than a *Crab-Stock*; but then indeed they conclude the *Tree* lasts not so long; and 'tis observ'd, That *Apples* are better tasted from a clean, light land, &c. than from stiffer clay, or the more pinguid and luxurious soil, whence we may expect some assistance from the civility of the *Stock*, which is a kind of prepared *soil*, or foundation to the *Graff*; even as our very *Transplantations* into better ground is likewise a kind of *Grafting*.

Thus in like manner our Master *Varro*, loco citato concerning *Pears*; *Si in Pyrum Sylvaticam*, &c. The *Wild-stock* does enliven the dull and phlegmatic *Apple*, and the *Stock* of a *Gennet-Moyle* sweeten and improve an *Apple* that seems *over-tart*, as the *Pome-roy*, or some *Greening*, &c. or may rather seem to abate at least some *Apple* over-tart and severe.

Your *Crab-stock* would be plant'd about *October*, at thirty two Foot distance, and not *grafted* till the third *Spring* after, or at least not before the *second*.

But if your design be for *Orchard* only, and where they are to abide, an interval of sixteen Foot shall suffice for the *Dwarfish* kind, or in the Grounds where the *Red-strake*, or other *Fruit-trees* are of small bulk, provided the ground be yearly turn'd up with the *spade*, and the distance quadrupled where the *Plough* has privileged; this being the most expedite for such as have no *Nursery* ground.

C H A P. III.

Of Graffs and Infitions.

MAke choice of your *Graffs* from a constant and well-bearing Branch.

And as the *Stock* hath a more verdant rind, and is capable to yield more plenty of *juice*, so let the *Graff* have more *Eyes* or *Buds*: Ordinarily three or four *Eyes* are sufficient to give issue to the *Sap*; but as well in *Apples*, and *Pears*, as in *Vines*, those *Graffs* or *Cions* are prefer'd in which the *buds* are not too far asunder, or distant from the foot thereof: and such a number of *buds* usually determining the length of the *Graff*, there may divers *Cions* be made of one *Branch*, where you cannot procure plenty of them for severals.

As to the success of *grafting*, the main point is, to joyn the inward rind of the *Cion* to the inward rind of the *Stock*, so that the *Sap* of the *One*, may there meet with the *Sap* of the *Other*, and these parts should be joyn'd closely, but not too forcibly; that being the best and most infallible way, by which most of the quick and juicy parts are mutually united, especially towards the bottom.

If the *Stock* be so big as to endanger the pinching of your *Graff*, when the *wedge* is drawn out of the *cleft*, let the inner side of the *Graff*, which is within the wood of the *Stock*, be left the thicker, that so the *woody* part of the *Cion* may bear the stress, and the *Sappy* part be preserved from bruising. Some by an happy-hand, do with good success *Graff* without cleaving the *Stock* at all, only by *Incisions* in the *Rind*, as the *Industrious* Mr. *Austin* teaches us: But since this is not for every *Rustic* hand, nor seems to fortifie so strongly against impetuous *Winds*, before the Union be *secure*, there had need be some extraordinary defence.

Choose the straightest and smoothest part of the *Stock* for the place where you intend to *Graff*: If the *Stock* be all knotty (which some esteem no impediment) or crooked, rectifie it with the fittest posture of the *Graff*.

For a *Graff* covet not a *Cion* too slender; for the *Sun* and *Wind* will sooner enforce it to wither: Yet are we to distinguish, that for *Inoculation*, we take the *Bud* from a sprig of the last years shoot; and most allow that the *Cion* should also have some of the former with it, that it may be the stronger to *Graff*, and abide to be put close into the *Stock*, which is thought to advance it in bearing.

In *Heresfordshire* they do frequently choose a *Graff* of several years growth; and for the *grafting* of such large *Stocks* as are taken out of the *Woods* or *Nurseries*, and fitted into rows for *Orchards*, they choose not the *Graffs* so small as in other Countries they require them; which has, it seems, occasion'd some complaint from them

them that understand not the Reason of the first breach of this Note. Once for all, the stumpy *Graff* will be found much superior to the slender one, and make a much nobler and larger Shoot. This upon experience.

Graff your *Cions* on that side of the *Stock* where it may receive the least hurt from the *South-west* Wind, it being the most common, and most violent that blows in *Summer*; so as the *wind* may blow it to the *Stock*, not from it: And when the *Zephyres* of the *Spring* are stirring, choose that *Season* before all others for this work.

Some there are who talk of removing the *Stock* about *Christmas*, and then also *Graff* it; which there be that glory they can successfully do even by the fire side, and so not be forc'd to expect a two or three years rooting of the *Stock*; But in this *Adventure* 'tis advisable to plunge the *Graff* three or four inches deep in the *Stock*. Lastly,

Be careful that the *Rain* get not into the *clefs* of your young grafted *Stocks*: Yet it has been noted, That many old Trees (quite decay'd with an inward hollown'ess) have born as full burdens, and constantly, as the very soundest, and the Fruit found to be more delicate than usually the same kind from a perfect and more entire *Stock*.

Except some former case requires it, leave not your *Graffs* above four, five, or (at most) six inches of length above the *Stock*; for by the length it draws more feebly, and is more expos'd to the shocks of the *Wind*, or hurt by the *Birds*; and you shall frequently perceive the summities and tops of such young *Graffs* to be mortified and die.

The *Genet-moyle* is commonly propagated by cutting off the *Branch* a little below a *Burr-knot*, and setting it without any more Ceremony; but if they be also grafted first as they grow on the *Tree*, and when they have covered the *head*, cut off below the *Burr*, and set, it is far better: In this separation cut a little beneath the *Burr*, and peel off, or prick the *Bark*, almost to the *knot*: Thus also if the *Branch* have more *knots* than one, you may *graft*, and *cut off* yearly, till within half a foot of the very *stem*, which you may *graft* likewise, and so let stand.

Now for encouragement in transporting *Graffs* at great distance, we find that with little care (their tops uncut and unbruised) they will hold good, and may support the transportation by *Sea* or *Land* from *October* or *November* to the very end of *March*: See Sir H. Plot's *Officers*, Paragr. 75. To which may be added, That if the *Graff* receives no hurt by lying in the *Stock* expos'd to all rain, dews, and severities of *Winter* frosts from *December* to *Spring*, (as has been experimentally noted;) then (by a stronger presumption) in oyled, or rather waxen Leather, it may undoubtedly escape. Some prescribe, That the *ends* shall be stuck in a *Turnip*: and many excellent *Graffers* (*Gentlemen* some of very good credit) have assured us, That the *Graffs* which seemed withered, and fit to be cast away, have proved the best when tri'd. Thus in honest *Bar-*
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naby Googes noble *Heresbachius* you will find it commended to gather your *Cions* in the wane of the *Moon*, at least ten days before you *graft* them; and *Constantine* gives this reason for it, That the *Graff* a little withered, and thirsty, may be the better received of the *Stock*: I know some who keep them in *Earth*, from the end of *October*, till the *Spring*, and will hardly use them before. There are also other inducements for this practice, as *Simon Harwood* pag. 4. has shew'd us; but none beyond our own experience, who have known *Graffs* gathered in *December* thrive and do perfectly well.

The best expedient to convey *Graffs* is to stick the *cut ends* in *Clay*, envelop'd with a *clout* to preserve it from falling off; and to wrap the other part of the *Twigs* in dry *Hay* or *straw-bands*, which will secure them both from the *Winds*, *Galling*, and other injuries in Transportation: Nay, I have known them sent many *hundred Miles* from beyond the *Seas* accommodated to an ordinary Letter, and though somewhat short, and with very few *Buds*, yet with excellent success; and if this course were more universally consider'd, we might be furnish'd with many great *Curiosities* with little difficulty or charge.

C H A P. IV.

Of Variety and Improvements.

IF any man would have *variety* of unexpected and unknown *Apples* and *Pears*, for the improvement of *Cider*, or *Palate-fruit*, there is more hope from *Kernels* rais'd in the *Nursery* (as has already been directed) than from such tryals of *graftings* as we have yet seen in present use.

But if we would recover the patience, and the sedulity of the *Antient* (of which some brief account will follow) or listen to some unusual Proposals, then may we undertake for some variety by *Infusions*.

To delude none with Promises, we do much rather recommend the diligence of enquiring from all *Countries* the best *Graffs* of such *Fruits* as are already found excellent for the purpose we design: As from the *Turgovians* for that Pear of which Dr. *Pell* gives so good and weighty informations; and of which I had presented me some *Graffs*, together with a taste of the most superlative *Perry* the *World* certainly produces; both which were brought near 800 Miles, without suffering the least diminution of Excellency, by my Worthy Friend Mr. *Hake* a Member of the *R. Society*, in the year 1666, and tasting as high, and as rich as ever to the present year I am writing this *Paragraph*.

But as some sorts are to be enquired after for the *Palate* and the
Table,

Table, so 'tis now our main business to search after such as are excellent for their *Liquor*, either as more pleasant, more *wi. y.*, or more lasting; of which sort the *Borbury bare-land-Pear* excels. The *Red strake*, *Brombury Crab*, and that other much celebrated *Wild-ling* call'd the *Oaken-pin*, as the best for *Cider*; though for sufficient reasons we do yet prefer the *Red strake*, to oblige the emulation of other *Countries*, 'till they find out a *Fruit* which shall excel it, and which we do most heartily wish.

But to pursue the diligence of the *Antients*, we direct the eye to a general expedient for all kind of *varieties* imaginable, and which we hold far better than to present the World with a *List* of the particulars either known, or experimented: For who indeed but a *Fool* will dare to tell *Wonders* in this severe *Age*, and upon an *Argument* which is so environ'd with *Imposure* in most *Writers* old or new? Much less pretend to *Experiments* which may fail to succeed by default of an unhappy *occasion*, when the conclusion must be, *Penes Authorem sit fides*.

And truly men receive no small discouragement from the ugly affronts of *Clowns*, and less cultivated persons, who laugh and scorn at every thing which is above their understanding: For example; *I knew a man* (writes Dr. Beale to me) *and he a most diligent Planter and Grasser, who for thirty or forty years made innumerable Essays to produce some change of an Apple by Grafting: It seems he was ambitious to leave his Name on such a Fruit, if he could have obtained it; but always fail'd; for he perpetually made his Trials upon Crab-stocks, or such (at least) as did not greatly differ from the kind; and he ever found that the Graft would predominate. And how infinitely such Men having lost their own aims, will despise better Advice, we leave to observation.*

However, let us add, That where nothing is more facile than to raise new kinds of *Apples* (in infinitum) from *Kernels*: Yet in that *Apple-Country* (so much addicted to *Orchards*) we could never encounter more than two or three persons that did believe it: But in other places we meet with many that, on the other side, repute *Wildlings*, or (as they call them) *Kernel-fruit*, at all adventure, and without choice, to be the very best of *Cider-fruit*, and to make the most noble *Liquor*. So much does the common judgment differ in several *Countries*, though at no considerable distance, even in matters of visible *Fact*, and *epidemic* experience.

It has been soberly affirmed, that by *grafting* any *White Apple* upon an *Elm*, it changes the *Apple*, and particularly to a red colour: I have a *Direction* where we may be eye-witnesses of the proof; whatever the Truth of it be, we are not over-hastily to erect *Heracles's Pillars*: but rather to encourage the *Experiment*.

To gratify yet the *Ingenious*, instruct others, and emancipate us all from these *hastinado Clowns*, we are furnish'd with many *Arguments* and proofs to assure a good success, at least for *variety* and *change*, if not for infinite choice: Two or three antient *References* being duly premis'd; namely, First,

1. That 'tis in vain to expect change of *Apples* from *Grafting* upon differing *Stocks* of *Crabs* or *Apples*.

2. In vain also are we to look for a kind Tree from a very much differing *Stock*; as an altered *Pear* to grow kindly on a *Crab* or *Apple-stock*, & contra. There go about indeed some *jugglings*, but we disdain to name them.

It is one thing to find the kindest *Stock* for the Improvement of any *Fruit*; as the *Crab-stock* for the delicate *Apple*, the *Wild* or *Black-Cherry-stock*, for the *grass* of the fairest *Cherries*; the largest *Vine*, (whose root makes best shift for relief) to accept the *Graft* of the more delicate *Vines*; the *White Pear-Plum Stock*, for the *Abri-cot*, &c. And another thing it is to seek the *Stock* which begets the wonder, variety, and that same transcendent and particular excellency we inquire after: For this must be at more remote distance; and we offer from the *Ancients* to show how it may be at any distance whatsoever: But the whole expedient seems to be hinted by Sir H. Plat, pag. 72. where he affirms, that *If two Trees grow together, that be apt to be grafted one into another, then let one branch into another, workmanly joining Sapto Sap*. This our *Gardeners* call *Grafting by Approach*, and is explicated at large by *Columella*.

But in this express *Rule* he is too narrow for our purpose, and far short of old experience; as we find in *Parag. 63*. where he affirms, *We may not graft a contrary Fruit thereon*. Against this we urge; That any contrary *Fruit* may be adventured, and any *Fruit* upon any fruitless *Stock* growing in propinquity in the same *Nursery*; as it is not only affirm'd, but seriously undertaken, and experimentally proved by the sober *Columella*, in several of his *Treatises*; Turn to the eleventh Chapter of his fifth Book, (*Stephens* Edition) *Sed cum antiqui negaverint posse omne genus surculorum in omnem Arborem inseri, & illam quasi finitionem, qua nos paulo ante usi sumus, veluti quandam legem sanxerint, eos tantum surculos posse coalescere, qui sint cortice, ac libro, & fructu consimiles iis arboribus quibus inseruntur, existimavimus errorem huius opinionis discutiendum, tradendumque posteris rationem, qua possit omne genus surculi omni generi Arboris inseri*. And the example follows in a *Graft* of an *Olive* into a *Fig-stock* by *Approach* (as we call it,) which he also repeats in the 27th. Chapter of his Book *De Arboribus*, without altering a syllable. But possibly in this check at the *Ancient* he might aim at old *Varro*, whom we find threatening no less than *Thunderbolts* and *Blasts* to those who should attempt these strange *Marriages*, and did not fort the *Graft* with the *Tree*; consult *lib. 1. cap. 40*. And yet you may see this *Art* assum'd by *Columella* for his own invention (1500 years since) to be no new to *Varro* 200 years older; where he goes on, *Est altera species ex arbore in arborem inserendi nuper animadversa in arboribus propinquis*, &c. Though here again we may question our *Masters* nuper *animadversa* too; since before he was born *Cato* relates it as usual to *Graft Vines* in the manner by them prescribed, *cap. 41. Tertia institio est: Terebra vitem quam inseres, &c.* Which by the way makes us admire how the witty *Walchins* in his *Discourse De vitibus fructuarius*, pag. 265. could recount the *grafting* of *Vines* amongst the wonders of *Modern Inventions*.

But it seems *Varro* and his *Contemporaries* did extend the practice beyond *Cato*; and *Columella* proceeded further than *Varro*, even to all sorts of Trees, however differing in nature, quality, bark, or season: And then *Palladius* allumes the result, and gives us the particulars of the success in his *Poem, De Institutionibus*. And to these four as in chief (no phantastical or counterfeit persons) we refer the Industrious.

But be pleas'd to take this note also: As soon as your *Graff* hath attained to a *second*, or at farthest a *third* years growth, take it off the *Stock*, and then graff it upon a *Stock* of a more natural kind: For in our own *Trials* we have found a *graft* prosper the second year exceeding well; yet the third the whole growth at once blasted quite to the very *Stock*, as if *Varro's* Augurs had said the word.

To this add, the making use of such *Stocks* as in this *Experiment* may contribute some special aid to several kinds of humane *Infirmities*: As suppose the Birch Tree for the *Stone*, the Elm for *Feavers*, &c. For 'tis evident, that by such *Institutions*, the Branch may convert the *Sap* of the *Root* even of another species into its own nature, and alter all its properties; though in some they *domineer*, as the Branch of the Apple in the *Rhamnus*, or *Mezereau*, acquires a *Purgative* quality. And by these means why may not the *Fruit* by effectual *Marriages* be rendred *Cordial*, *Astringent*, *Purgative*, *Sudorific*, *Soporiferous*, and even *Deleterious* and *Mortal*: But this we only hint.

Moreover, To graff rather the *Wilding*, or *Crab*, than the *Pepin*, because the *Wilding* is the more natural; and Nature does more delight in *progress*, than to be *Retrograde* and go backwards.

I should also expect far more advance from a more *pungent Sap*, than from *Insipid*; as generally we see the best and vigorous *juices* to salute our *Palats* with a more agreeable *piquancy* and tartness, for so we find the relish of the *Stocking-Apple*, *Golden Pepin*, *Pearmain*, *Eliot*, *Harvy*, and all (both *Russetings* and *Greenings*) to be more poignant than of others.

And here we note from *Palladius*, That the *Ancients* had the success which we all, and particularly Sir *H. Plat*, does so frequently deny, as in the particular of *grafting* the *Apple* on the *Pear*, & *contra*. Let us hear him *de Pomo*.

The *Graffed-Crab* its bushy Head does rear,
Much *Meliorating* the infected *Pear*:
Its self to leave its *Wildness* does invite,
And in a *Nobler issue* to delight.

*Insita proceris pergit concrefcere ramis,
Et sociam mutat malus amica Pyrum:
Sæpe feros sylvæ hortatur linqvere mores,
Et partu gaudet nobiliore frui.*
Pallad. de Institutionib. lib. 14.

But

Or, An Appendix concerning Fruit-Trees, &c.

But possibly *Palladius* assum'd this *Poetical* expression, upon presumption, that no man in his days durst degrade the most excellent *Quince* to support the *Cyon* of another *Fruit*, which then must be of less esteem, but we by our *luxury* have found the success.

And we have good argument to believe; That *Virgil*, and *Columella*, in several of their wonderful Relations of these kinds of mixture, (which but for the prolixity we might now recite) did not so far affect *Wonders* as to desert the truth.

You may also observe, That as well the *French Gardiner*, and our *Modern Planters*, have found the same benefit from the *Stock* of the *Quince*, as old *Palladius* did, it seems, acknowledg'd; yet (as he conceiv'd) more hospitable still with its own *kindred*, and that

Though the *Quince-stock* admit all other *Fruit*,
Its *Cyon* with no other *stock* will suit:
Scorning the *Bark* of Foreign Trees, does know
Such lovely *Fruit* on no mean *stem* can grow:
But the *Quince-Graff*, to the *Quince-stock* is joyn'd,
Contented only to improve its kind.

*Cum præstet cunctis se fulva cydonia pomis,
Alterius nullo creditur hospitio.
Roboris externi librum aspernata superbit,
Scit tantum nullo crescere posse decus:
Sed propriis pandens cognata cubilarum ramis,
Stat, contenta suum nobilitare bonum.*
Pallad. de Malo Cidonio.

Lastly, We did by unexpected chance find the facility of *grafting* the very youngest *stocks*, even of one years growth, by the *Root*: At a second removal of the *Stocks* (being then of two years growth) we observed some *Roots* so fast closed together into one, as not to be divorced: Hereupon we concluded, If casualty, or negligence, chance of spade, or oppression of neighbourhood did this, by *Art* it might be done more effectually, and possibly to some desirable purpose; for that then the *stock* was more apt to receive a mastering *Impression*; and any *Garden Plant* whatsoever might by this process interchange and mingle their *Roots*. But this can extend no farther than the *Stock* may prevail with the *Graff*.

And thus we have presented our diligent *Ciderist* with what Observations and Arguments of Encouragement, grounded on frequent Experience, we have received from our most ingenious Correspondents, especially the Learned and truly Candid Dr. Beale, in whole Person we have so long entertain'd you: and to these we could add sundry others, were it not now time (whiles we discourse of possibilities) to conclude with something certain, and to speak of what we have.

For the kind then of *Cider-Apples* in being; Gloucester-shire affects the *Bromsbury Crab*; It affords a smart, winy *Liquor*, and is
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peculiarly hardy, but not so proper for a cold and late-bearing Climate, it being not ripe in hot Land till the end of Autumn, nor fit to be ground for Cider till Christmas, lying so long in heaps and preparation.

It is in the same Shire that they likewise much esteem of the white and red Must-Apple, the sweetest as well as lowest *Pepin*, and the *Harvy-Apple*, which (being boy'd) some prefer to the very best of all *Ciders*; though from any experience we have yet seen, we cannot recommend it, and it will want more particular and infallible Directions before we can be reconciled to the Adventure, which we have observed so frequently to miscarry.

But about London, and the more Southern Tracts, the *Pepin*, and especially the *Golden*, is esteemed for the making of the most delicious of that Liquor, most wholesom, and most restorative; and indeed it may (in my poor judgment) challenge those perfections with very good reason.

By others the *Pearmain* alone is thought to come in competition with the best; but, say they, the *Cider* is for the most part found of the weakest, unless encourag'd with some agreeable *Pepin* to inspire it; whereas this is to be taken according to the constitution of the Fruit; for even *Pepins* do differ as much from *Pepins* in Taste and Liquor, as the *Kind*, and the *Soil* dispose them; nay, though of the same Species; so as the *Cider* of the *Pearmain* (though likewise very different) does not seldom exceed it in that briskness which others attribute to the *Pepin*, which is for the most part more smooth and less poyntant: I conceive a good way of extracting the Spirits of these Fruits, might prove a likely Criterion to ground our judgments on in all these niceties; whilst by the way, we may note, that of all Apples, that bear one general Name, the *Pepin* seems the most to differ; and the *Cider* from the genuine *Cider-Fruit*, keeps nearest to the same strength and relish.

Some commend the *Fox-Whelp*; and the *Gennet Moyle* was once prefer'd to the very *Redstrake*, and before the *Bromsbury Crab*; but upon more mature consideration, the very Criticks themselves now Recant, as being too effeminate and soft for a judicious Palate.

The *Red-strake* then amongst these accurate Tasters hath obtained the absolute preeminence of all other *Cider-fruit*, especially in Herefordshire, as being the richest and most vinous Liquor, and now with the more earnestness commended to our practice, for its celerity in becoming an Orchard, being ordinarily as full of Fruit at ten years growth as other Trees are at twenty; the *Pepin* or *Pearmain* at thirty: And lastly, from that no contemptible quality, That though the smiles of it intice even on the Tree, as being indeed better than most other Table fruits whilst hanging, yet it needs no Priapus for Protector, since (as beautiful as 'tis) it has no such temptation to the *Tast*, 'till it be either baked, or converted into *Cider*. The same may be affirmed also of the *Bromsbury Crab*, *Bareland-Pear*, and many other Wildings, who are no less at their Self-defence; yet the *Gennet-Moyle* at due maturity, has both a gentle, and agreeable relish; their unagreeableness to the Palate (as elsewhere

where noted) proceeding only from the separation the juice makes from the Pulp, which even Children do remedy by consulting them on their sharpened Elbows; which (if thoroughly weigh'd) seems to dispute, if not overthrow some Hypothesis of Fermentation.

In sum, The *Red-strake* will at three years grafting give you fair hopes, and last almost an hundred years; if from sundry mens Experience of more than 60 years, we may divine, and that it agree with the *Soyl*. And the *Gennet-Moyles* hasten to an Orchard for *Cider* without trouble of Art or Grafting: But note, That this Tree is very apt to contract a bur-knot near its Trunk, where it begins to divide; and being cut off under that boss, commonly grows (if so set) and becomes speedily a Tree, except it encounter an extraordinary dry Summer the first year to give it check. And though the knack of grafting be so obvious, yet this more appearing facility does please the lazy Clowns, that in some places they neither have nor desire any other Orchards; and how this humour prevails you may perceive by the hasty progress of our Kentish Codlin in most parts of England. But this hasty growth and maturity of the Tree is by another Instance confirm'd to us from that worthy Gent. Mr. Blount of Orleton, who writes me word, that some of the rejected Spray, or Prunings of the *Gennet-Moyle*, taken by chance to rice a Plot of Pease (though stuck into the Earth but at April) put forth root, grew, blossom'd, and bore Apples the same year.

But to advance again our *Red-strake*, even above the *Pepin*, and the rest (besides the celerity of the improvement and constant burthen) consider we the most incredible product, since we may expect from each Apple more than double the quantity; so as in the same Orchard, under the same culture, thirty *Red-strake* Trees shall at ten years grafting yield more *Cider* than a hundred of those *Pepins*, and surmount them in proportion during their period at least sixty or seventy years: So that granting the *Cider* of the *Golden-Pepin* should excel, (which with some is precarious) yet 'tis in no wise proper for a *Cider-Orchard*, according to our general design, not by half so soon bearing, nor so constantly, nor in that quantity, nor fullest or security; for as 'tis no tall Tree, so is it less expos'd to blasts and the like inconveniences; besides, it is a good kitchen-fruit for the season it continues.

Concerning *Perry*, the *Horse-Pear* and *Bear-land-Pear* are reputed of the best, as bearing almost their weight of spiritous and vinous Liquor. The Experienced prefer the tawny or ruddy sort, as the colour of all other most proper for *Perry*: They will grow in common-fields, gravelly, wild, and stony ground, to that largeness as one only Tree has been usually known to make three or four Hogheads: That of *Bosbery*, and some others, are so tart and harsh that there is nothing more safe from plunder, when even a Swine will not take them in his mouth. But thus likewise would the abundance preserve these Fruits, as we see it does in Normandy.

Some

Some have reckon'd the *Codling* among the *Cider-fruits*, it is a Tree of Comfort, propagated by *cuttings*, improv'd by *Grafting*, continable to *Cont'epalieres* or *Hedges*, but more plentifully bearing when more at liberty.

CHAP. V.

Of the Place and Order.

WE do seriously prefer a very wild Orchard, as mainly intended for the publick utility, and to our purpose of obliging the People, as with a speedy *Plantation* yielding store for *Cider*: Upon this it is that we do so frequently inculcate, how well they thrive upon *Arable*, whilst the continuing it so accelerates the growth in almost half the time: And if the *Arable* can be so levell'd (as commonly we see it for *Barly-land*) then without detriment it may assume the Ornament of *Cyprus*, and flourish in the *Quincunx*.

If it be *shallow* Land, or must be rais'd with high *Ridges*, then 'tis necessary to have more regard of planting on the *tops* of those eminencies, and to excuse the unavoidable breach of the *decussis*, as my Lord *Verulam* excuseth the defect of our humane *phanties* in the *Constellations*, which obey the *Omnipotent* order rather than ours: Add to this the rigour of the *Royal Society*, which approves more of *plainness* and *usefulness*, than of *niceness* and *curiosity*; whilst many putting themselves to the vast charge of levelling their grounds, oftentimes make them but the worse; since where the places are full of gasty inequalities, there may be planted some sorts of *Cider fruit*, which is apt by the great burden to be press'd down to the ground, and there (whiles it hides *Irregularities*) to bear much better, and abundantly beyond belief; for so have been seen many such recumbent *Pear-trees* bear each of them *two, three, yea, even to six* or more *Hogheads* yearly.

And for this *Cider*, whiles we prefer some sorts of *Wildings* which do not tempt the palate of a *Thief*, by the caution we shall not provoke any man to repent his charge from the necessity of richer and more reserv'd *Enclosures*; Though we have frequently seen divers *Orchards* successfully planted on very poor *Arable*, and even in stony *Glebe, gravel and clay*, and that pretty high on the sides and declivities of *Hills*, where it only bears very short grass, like to the most ordinary *Common*, not worth the charge of *Tillage*: And yet even there the *Tenants* and *Confiners* sometimes enclose it for the *Fruit*, and find their reward, though not equally to such *Orchards* as are planted on better ground, and in the *Vallies*. Hence we suggest, That if there be no *Statute* for it, 'twere to be wish'd there were a *Law* which should allow *endeavours* of this nature

Or, An Appendix concerning Fruit-Trees, &c.

nature out of the *Common field*, to enclose for these *Encouragements*; since both the *Publick* and the *Poor* (whatever the clamour is) are advantaged by such *Enclosures*, as *Tusser* in his old Rhimes, and all indifferent observers apprehend with good reason.

True indeed it is, That all Land is not fit for *Orcharding*, so as even where to form just *Inclosures* being either too *shallow* and *dry*, or too *wet* and *staring*: But this (saith the judicious Mr. *Buckland*) we may aver, That there are few *Parishes, or Hamlets* in *England* where there are not some *fat and deep Headlands* capable of Rows of Trees; and that (as hath been said) the raised Banks of all *Inclosures* generally by the advantage of the depth, *fatness*, and health of their *Mold*, yield ready opportunity for planting; (yea, and in many Countrys multitudes of *Crab stocks* fit to be grafted;) in which latter (saith he) I have frequently observed very goodly *Fruit-bearing Trees*, when in the same soil Trees in *Orchards* have been poor and worth nothing. To conclude,

If the soil be very bad and unkind, any other *Fruit* (which it may more freely yield without requiring much depth, and less *Sun*) may be planted instead of *Apples*. In the mean time for those who should rather chouse to confine their *Cider Plantation* into a narrower circle: It has been calculated, that one *Acre* of Ground may contain an hundred *Red-strakes* at 20 foot interval; which (supposing to have cost five pounds to perfect the Orchard) may well yield the owner an hundred bushels, one tree with another at seven years growth; which at but six pence per Bushel amounting to fifty shillings and the *Herbage* twenty, ought to be no discouragement to the planter; since by the eighth or ninth year he may expect at the least three hundred bushels, and in fruitful years 500 Bushels worth eighteen pence the Bushel, an extraordinary improvement, as will appear upon calculation.

CHAP. VI.

Of Transplanting, and Distance.

THE most proper season for *Transplanting* is before the hard Frosts of *Winter* surprize you, and that is a competent while before *Christmas*: And the main point is, to see that the *Roots* be larger than the *Head*; and the more ways that extends, the better and firmer.

If the *Stock* seems able to stand on its own three or four legs (as we may call 'em) and then after settlement some stones be heaped or laid about it, as it were gently wedging it fast, and safe from Winds (which stones may after the second or third year be removed) it will save from the main danger: For if the *Roots* be much shaken the first *Spring*, it will hardly recover it.

You

You may transplant a *Fruit-Tree* almost at any tolerable *season* of the *Tear*, especially if you apprehend it may be spent before you have finish'd your work, having many to remove: Thus, let your *Trees* be taken up about *Allhallontide*, (or as soon as the *leaf* begins to fall:) then having trimm'd and quickn'd the *Roots*, set them in a *Pit*, forty, fifty, or a hundred together, yet so as they may be covered with mold, and kept very fresh: By the *spring* they will be found well cured of their *wounds*, and so ready to strike *root* and put forth, that being *Transplanted* where they are to stand, they will take suddenly, and seldom fail; whereas being thus cut at *spring* they recover with greater hazard.

The very *Roots* of *Trees* planted in the ground, and buried within a quarter of an Inch, or little more, of the level of the *Bed*, will sprout, and grow to be very good *Stocks*. This and the other being Experiments of our own, we thought convenient to mention.

By the oft removal of a *Wild-stock*, cutting the ends of the *Roots*, and disbranching somewhat of the *Head* at every change of place, it will greatly abate of its natural *wildness*, and in time bring forth more *civil* and *ingenuous* Fruit: Thus *Gilly-flowers* do (by oft removals, and at *full-Moon* especially) increase and multiply the leaves.

Plant not too deep; for the *over-turf* is always richer than the *next* Mold. How material it is to keep the *coast* or side of the *Stock*, as well in *Fruit-trees* as in *Forest*, we have sufficiently discuss'd; nor is the *Negative* to be prov'd.

See Aph. 35. For the *distance* in *Fields*, they may be set from *thirty two* to *sixty* Foot, so as not to hinder the *Plough*, nor the benefit of manure and soil; but in *hedg-rows* as much nearer as you please, Sun and Air considered.

C H A P. VII.

Of the Fencing.

Seeing a *Cider-Orchard* is but a wild Plantation, best in *Arable* well enclos'd from *Beasts*, and yet better on the *Tops*, *Ridges*, and natural *Inequalities*, (though with some loss of Order, as we shew'd,) one of the greatest discouragements is the *preserving* of our *Trees* being planted, the raising of them so familiar.

We have in our *sylva* treated in particular of this, as of one of the most material *obstacles*; wherein yet we did purposely omit one *Expedient*, which came then to our hands from the very Industrious Mr. *Buckland* to the Learned Dr. *Beal*: You shall have it in his own words.

This of Fencing single Trees useth to be done by Rails at great charges;

Or, An Appendix concerning Fruit-Trees, &c.

charges; or by Hedges and Bushes, which every other year must be renew'd, and the materials not to be had in all places: neither. I therefore prefer and commend to you the ensuing form of Planting and Fencing, which is more cheap and easy, and which hath other Advantages in it, and not commonly known. I never saw it but once, and that imperfectly performed; but have practis'd it myself with success: Take it thus.

Set your Tree on the Green-sward, or five or six inches under it if the soil be very healthy; if moist or weeping, half a foot above it; then cut a Trench round that Tree, two foot or more in the clear from it: Lay a rank of the Turfs, with the grass outward, upon the inner side of the Trench towards your Plant, and then a second rank upon the former, and so a third, and fourth, all orderly plac'd, (as in a Fortification) and leaning towards the Tree, after the form of a Pyramide, or larger Hop-hill: Always as you place a row of Turfs in compass, you must fill up the inner part of the Circle with the loose Earth of the second spit which you dig out of your Trench, and which is to be two foot and half wide, or more, as you desire to mount the hillock, which by this means you will have rais'd about your Plant near three foot in height. At the point it needs not be above two foot or eighteen inches diameter, where you may leave the Earth in form of a Dish, to convey the Rain towards the body of the Tree; and upon the top of this hillock prick up five or six small Briars or Thorns, binding them lightly to the body of the Plant, and you have finish'd the work.

The commodities of this kind of Planting are,

First, Neither Swine, nor Sheep, nor any other sort of Cattel can annoy your Trees.

Secondly, You may adventure to set the smaller Plants, being thus rais'd, and secur'd from the reach of Cattel.

Thirdly, Your Trees fasten in the Hillock against violence of Winds, without Stakes to fret and canker them.

Fourthly, If the soil be wet, it is hereby made healthy.

Fifthly, If very dry, the hillock defends from the outward heat.

Sixthly, It prevents the Couch-grass, which for the first years insensibly robs most plants in sandy grounds apt to graze. And,

Lastly, The grazing bank will recompence the niggardly Farmer for the waste of his Ditch, which otherwise he will sorely bethink.

In the second or third year (by what time your Roots spread) the Trench, if the Ground be moist, or Seasons wet, will be near fill'd up again by the treading of Cattel: for it need not be cleans'd; but then you must renew your Thorns: Yet if the Planter be curious, I should advise a casting of some small quantity of rich Mold into the bottom of the Trench the second year, which may improve the growth, and invite the Roots to spread.

In this manner of Planting, where the soil is not rich, the exact Planter should add a little quantity to each Root of Earth from a frequented High-way, or Yard where Cattel are kept: One Load will suffice for six or seven Trees; this being much more proper than rotten soil or loose Earth; the fat Mold best agreeing with the Apple Tree.

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The broader and deeper your Ditch is, the higher will be your Bank, and the securer your Fence; but then you must add some good Earth in the second year, as before.

I must subjoin, That only Trees of an upright growth be thus planted in open grounds; because spreading of low growing Trees will be still within reach of Cattel as they encrease: Nor have I met with any inconvenience in this kind of Transplanting (which is applicable to all sorts of Trees) but that the Mole and the Ant may find ready entertainment the first year, and sometime impairs a weak rooted Plant; otherwise it rarely miscarries. In sum,

This manner of Fencing is soon executed by an indifferent Work-man, who will easily set and guard six Trees in a Winter day. Thus far Mr. Buckland: To which we shall only add, That those which are planted in the Hedge-rows need none of these defences; for (I am told) in Hereford-shire in the Plantations of their Quick-sets, or any other, all men did so superstitiously place a Crab-stock at every twenty foot distance, as if they had been under some rigorous statute requiring it; and I am of Opinion, that 'twere better to be content with Fruit in the bordering Mounds, than to be at all this trouble toraise Tumps, or temporary banks in the midst of an Inclosure; or if Pears will thrive in the Plain of the Orchard, as we frequently see them, (where neither Apple or other Fruit could in appearance be expected) then Crabs, which may be raised on the Mounds, will kindly mix the Liquor into very good Beverage.

C H A P. VIII.

Of Pruning and Use of the Fruit-Trees.

THE Branches are to be lopp'd in proportion to the bruises of the Roots, whose fibers else should only be quickned, not altogether cut off nor intangled: For the Top, let a little of each arm be lopp'd in Cider-fruit only; but for the Pears, cut two or three buds deep at the summities of their aspiring Branches, just above the eye slanting; this will keep them from over-hasty mounting, reduce them into shape, and accelerate their bearing.

To this we add again out of Dr. Beals Herefordshire Orchards, pag. 23. *In a grafted plant every Bough should be lopped at the very tops, in Apples and Pears, as in Cherries and Plums, if Transplanted without violation of Roots, which only indeed renders it less necessary.*

In most kinds of natural Plants the Boughs should not at all be lopped, but some taken off close to the Trunk, that the Root at first Transplantation be not engaged to maintain too many Suckers,
this

Or, An Appendix concerning Fruit-Trees, &c.

this to be understood, though of such as grow naturally from the Kernel, or the Bur-knot; especially if removed after they are well rooted. And this must be done with such discretion, that the Top-branches be not too close together; for the natural Plant is apt to grow spiry, and thereby fails of fruitfulness. Therefore let the reserved Branches be divided at a convenient roundness.

The Branches of those we call natural Plants (for usually the Grafted generally fail) that are cut off, may be set, and will grow, though slowly.

If the Top prove spiry, or the fruit unkind, then the due remedy must be in re-grafting. See Chap. xxviii. in Sylva.

Besides the Perrys, dried and preserv'd Fruit, useful is the Pear-Tree (and best the most barren, or Pig-tail, as they call it, which is the Wild Pyralter) for its excellent colour'd Timber, hard and levigable (seldom or not ordinarily worm-eaten) especially for Stools, Tables, Chairs, Pistol-Stocks, Instrument-Maker, Cabinets, and very many works of the Joyner, (who can make it easily to counterfeit Ebony) and Sculptor, either for flat, or emboss'd-Works, and to Engrave upon, because the Grain intercepts not the Tool. And so is likewise both the Black-Cherry (especially for the Necks of Musical-Instruments) and the Plum-Tree.

ANIMADVERSION.

I*F some of the following Discourses seem less constant, or (upon occasion) repugnant to one another, they are to be consider'd as relating only to the several guits, and guises of Persons and Countries, and not to be looked upon as recommended Secrets, much less impos'd, farther than upon Tryal they may prove grateful to the Publick, and the different inclinations of those who affect these Drinks: nor in reason ought any to decry what is propos'd for the universal Benefit; since it costs them nothing but their civility to so many obliging Persons.*

J. E.

GENERAL
ADVERTISEMENTS

Concerning

CIDER:

By D^r B E A L E.

1. **H**E that would treat exactly of *Cider* and *Perry*, must lay his foundation so deep as to begin with the *Soyl*: For as no Culture or Grass will exalt the *French Wines* to compare with the *Wines* of *Greece*, *Canaries*, and *Montefiasco*; so neither will the *Cider* of *Bromyard* and *Ledbury* equal that of *Hamlacy*, and *Kings-Capell*, in the same small County of *Hereford*.

2. Yet the choice of the *Graff* or *Fruit* hath so much of prevalence, that the *Red-Strake-Cider* will every where excel common *Cider*, as the *Grape* of *Frontignac*, *Canary*, or *Baccharach*, excels the common *French Grape*; at least, till by time and tradition it degenerateth.

3. I cannot divine what *Soyl* or what *Fruit* would yield the best *Cider*; or, how excellent *Cyder* or *Perry* might be if all *Soils* in common and all *Fruit* were tried; but for *thirty years* I have tried all sorts of *Cider* in *Hereford-shire*, and for three years I have tried the best *Cider* in *Somerset-shire*, and for some years I have had the best *Cider* of *Kent* and *Essex* at my call; yet hitherto I have always found the *Cider* of *Hereford-shire* the best, and so adjudged by all good *Parties*. But I shall rejoice to be better informed, and truly from all other *Countries*; and do both wish and hope, that in a short time, we shall every where be rich in many *Improvements*.

4. I cannot undertake to particularize all kind of *Soil*, no more than to compute how many *Syllables* may be drawn from the *Alphabet*; the number of *Alphabetical Elements* being better known than the *Ingredients* and *Particles* of *Soil*, as *Chalk*, *Clay*, *Gravel*, *Sand*, *Marle*, (the tenaciousness, colour, and innumerable other qualities, shewing endless diversities;) and the *Fruit* of *Crabs*, *Apples*, and *Pears*, being as various as of *Grapes*, *Figs*, and *Plums*.

5. Yet in gross, this I note; That as *Bacchus amat colles*, and a light ground, so our best *Cider* comes from the hot *Rie-Lands*: In fat *Wheat-Land* it is more sluggish; and in white, stiff *Clay-Land*

Land (as in *Woolhope* in *Herefordshire*) the common *Cider* retains a thick whey-colour, and not good: Only such as riseth there (by the diligence or some *Art* of the *Inhabitants*;) is bright and clear, and so lively, that they are apt to challenge the best.

6. Some *Cider* mixeth kindly with *Water* in the *Cider-Mill*, and will hold out a good small *Wine*, and less inflaming, all the following *Summer*. Some *Cider* (as of *Long-hope*, a kind of four *Wood-Land* Country of *Herefordshire*) will not bear any mixture of *Water*, but soon decay, and turn more harsh and sour: And thus we noted in *France*, some coarse *Wines* stuck like paint in the *Glass*, unwilling to incorporate with the *Water*: *Vin d'Aye*, and other delicate *Wines*, did spread themselves more freely, as *gold* is more ductile than baser metals.

7. Some would, for a fit, extol the *Cider* of *Permain*, some of *Pepins*; (and of *Pepins* I have found a congenial *Liquor*, less afflicting *Splenetic* persons, as in mine own experience I conceived:) And Sir *Henry Ling* once extolled the *Cider* of *Elvots* (as richly bedewing the *Glais* like the best *Canaries*;) and full *Hogheads* of the *Stocking-Aple* have been tried amongst us, but disappointing our expectation, though perhaps by evil ordering: Yet Mr. *Gritten* highly boasted a Mixture of *Stocking-Aples* and *May-Pears*, tried (as I take it) by himself: After many years trial of those and many other kinds, the *Red-strake* carried the common fame, and from most of those reduced admirers. The *Gennet-Moyl Cider* was indeed more acceptable to tender *Palats*; and it will require *Custom* and *Judgment* to understand the preference of the *Red-strake*, whose mordicant sweetness most agreeably gives the farewell, endearing the relish to all flagrant *Palats*; which both obliges, whets, and sharpens the *stomach* with its masculine and *winy* vigour; and many thousands extol it for exceeding the ordinary *French-Wine*: But grant it should not be so strong as *Wine*; let me ask how many sober persons abroad addict themselves to mere *Wine*? Then compare this with diluted *Wine*, as usually for temperate men, and then let the trial be made, whether the *Pepin Cider* or *Red-strake* will retain the *winy* vigour in greater proportion of *Water*. Add to this, That they commonly mingle *Water* in the *Press*, with *Apples* (a good quantity) whiles they grinde the *Apples*, and the *Water* thus mixed, at that time, does so pleasingly incorporate in the grinding, fermentation, and maturity of *Vellling*, that 'tis quite another and far more pleasant thing than if so much or half so much *Water* were mingled in the *Cup* at the drinking time; as *Salt* on the *Trencher* will not give *Beef*, *Pork*, or *Neats-Tongue*, half that same relish which duly *powder'd* and timely season'd.

8. I, did, once, prefer the *Gennet-moyl Cider*, but had only the *Ladies* on my side, as gentler for their sugary *palats*, and for one or two sober draughts; but I saw cause to recant, and to confess the *Red-strake* to warm and whet the *Stomach*, either for meat or more drink.

9. The right *Cider-fruit*, is far more succulent, and the *Liquor* more easily divides from the *pulp* of the *Apple*, than in best *Table-fruit*,

fruit, in which the juice and the pulp seem friendly to dissolve together on the tongues end.

10. The *Liquor* of best *Cider-fruit* in the *Apple*, in best season of ripeness, is more brisk and smart than that which proves duller *Cider*: And generally the fiercest *Pears*, and a kind of tamer *Crabs*, (and such was the *Red-strake* called in my memory) makes the more *winy Cider*.

11. *Palladius* denieth *Perry* to bear the heat of *Summer*; but there is a *Pear* in *Bosbury*, and that Neighbourhood, which yields the *Liquor* richer the second year than the first, and so by my experience very much amended the third year: They talk much higher; but that's beyond my account.

12. As *Cider* is for some time a sluggard, so by like care it may be retained to keep the *Memorials* of many *Consuls*; and these smoaky bottles are the nappy *Wine*. My Lord *Scudamore* seldom fails of three or four years; and he is nobly liberal to offer the Trial.

13. As *red Apples*, so *red Pears* (and amongst them the *red Horse-pear* next to the *Bosbury*) have held out best for the stomach and durance: But *Pears* do less gratify the stomach than *Apples*.

14. The season of grinding these harsh *Pears* is after a full maturity, not till they have dropt from the Tree, and there lain under the Tree, or in heaps, a week, or thereabouts.

15. And so of *Cider-Apples*, as of *Grapes*, they require full maturity, which is best known by their natural fragrancy; and then also, as ripe *Grapes* require a few mellowing days, so do all *Apples*, as about a week or little more, so they be not bruised, which soon turns to rottenness; and better found from the Tree than rotten from the heap; though yet the juice of *Apples* and *Pears* (yea, of *Cherrys* or *Grapes*) is not altogether destroy'd, or quite putrified, as soon as the *Pulp* seems to be corrupted; neither haply needs there such curiosity, to cull and pick them so accurately, as some prescribe, though doubtless the cleaner, and less contaminated, the better.

16. That due maturity, and some rest on the heap, does makes the *Liquor* taste rather of *Apples* than *winy*, hath no more truth, (if the *Cider* be kept to fit age) than that very old *Cheese* doth taste of a *Posset*.

17. The harsher the *mild-fruit* is, the longer it must lye on heaps; for of the same fruit, suddenly ground, I have tasted good *Ver-juice*; being on heaps till near *Christmas*, all good-fellows called it *Rhenish-wine*.

18. The Grinding is somewhat considerable, rather too much than too little; here I saw a *Mill* in *Somersetshire* which grinds half a *Hoghead* at a grist, and so much the better ground for the frequent rolling.

19. * Soon after grinding it should be *prest*, and immediately be put into the *Vessel*, that it may ferment before the *spirits* be diffused; and then also in fermenting time the *Vent-hole* should not

* See for This excellent directions in Mr. Newburghs preserving of the surface; C. Taylors Vessel, and Dr. Smiths closing of it up.

be so wide as to allow a prodigal waste of the *spirits*; and as soon as the ferment begins to allay, the *Vessels* should be filled of the same, and well stopped.

20. Of late 'tis much commended, that before it be *prest*, the *Liquor* and *Must* should for four and twenty hours ferment together in a *Vat* for that purpose, covered, as *Ale* or *Beer* in the *Test-vat*, and then tunned up. This is said to enrich the liquor, and to give it somewhat of the *tincture* of some *red Apples*, as I have seen, and very well approved.

21. As *Sulphur* hath some use in *Wines*, so some do lay *Brimstone* on a *ragge*, and by a *wire* let it down into the *Cider-Vessel* and there fire it; and when the *Vessel* is full of the *smoak*, the liquor speedily poured in ferments the better. I cannot condemn this, for *Sulphur* is more kind to the *Lungs* than *Cider*, and the impurity will be discharged in the ferment.

22. *Apples* over-long hoarded before grinding will for a long time hold the liquor *thick*; and this liquor will be both pleasant, and as I think, wholesome; and we see some rich *Wines* of the later *Vintage*, and from *Greece*, retain a like crassitude, and they are both *meat* and *drink*.

23. I have seen thick harsh *Cider* the second *Summer* become clear and very richly pleasant; but I never saw clear *acid Cider* recover.

24. *Wheat* or *Leven* is good and kind in *Cider*, as in *Beer*; *Juniper-berries* agree well and friendly for *Coughs*, weak *Lungs*, and the aged, but not at first for every *Palate*: The most infallible and undiscerned improver, is *Mustard* a *Pint* to each *Hoghead*, bruised, as for *sauce*, with a mixture of the same *Cider*, and applied as soon as the *Vessel* is to be closed after fermenting.

25. *Bottling* is the next improver, and proper for *Cider*; some put two or three *Raisins* into every *Bottle*, which is to seek aid from the *Vine*. Here in *Somersetshire* I have seen as much as a *Walnut* of *sugar*, not without cause, used for this *Country Cider*.

26. *Crabs* do not hasten the decay of *Perry*, but preserve it, as *Salt* preserves *fish*. But *Pears* and *Crabs* being of a thousand kinds require more *Apporition*; this only I would *Note*, that *Land* which refuses *Apples*, is generally civil to *Pears*, and *Crabs* mingled with them, make a rich and wholesome *Cider*, and has sometimes challenged even the best *Red-Strake*.

27. Neither *Wheat*, *Leven*, *Sulphur*, nor *Mustard*, are used but by very few; and therefore are not necessary to make *Cider* last well, for two, three, or four years.

28. The time of drawing *Cider* into *Bottles* is best in *March*, it being then clarified by the *Winter*, and free from the heat of the *Sun*.

29. In drawing, the best is nearest the *heart* or middle of the *Vessel*, as the *Talk* in the *Egg*.

30. *Red-Strakes* are of divers kinds, but the name is in *Herefordshire* appropriated to one kind, which is fair and large, of a high purple colour, the smell *Aromatic*, the *Tree* a very *shrub*, soon

soon bearing a full burden, and seldom or never failing till it decays, which is much sooner than other *Apple-trees*. 'Tis lately spread all over *Herefordshire*; and he that computes speedy return, and true *Wine*, will think of no other *Cider-Apple*, till a better be found.

31. I said the *Red-strake* is a small *shrub*, 'tis of small growth where the *Cider* proves richest, for ought we have yet seen in *Herefordshire*, viz. in light quick land; and if the *land* be very dry, jejune and shallow, that and other *Cider-fruit* (especially the *Gennet-moyle*) will suspend the store of fruit alternatively every other year; except some *Blasts* or surprising *Frosts* in the *Spring* alter that *Method*; for two bad years seldom come together, very hardly three.

32. In good soil, I mean of *common field* (for fat land is not best for *Cider-fruit*, but common *arable*) I have seen the *Trees* of good growth, almost equalling other *Cider-trees*, the *Apple* larger and seldom failing of a good *burthen*: thus in the *Vales* of *Wheat-lands*, in strong *Glebe* or *Clay*, where the *Cider* is not so much extolled: but still *sack* is *sack*, and *Canary* differs from *Claret*; so does the *Red-strake-Cider* of the *Vale* excell any other *Cider* of the *forelaid* soil, such as is already celebrated for its kindness to good *Cider*.

33. Yet this distinction of *Soil* requires much *experience*, and great heed, if we insist upon accurate directions; for as *Laurentius* saith, *in pingui solo non crescunt omnia recte, neque in macro nihil*. And for *Gardens*, *Flowers*, and *Orchards*, I would chuse many times such lands as do not please the *Husbandman*, either for *Wheat* or sweet *Pasture*, which are his chief aims; and thus *Laurentius*, *In Arida & tenui terra felicius proveniunt Ruta, Allium, Petroselinum, Crocus, Hyssopus, Capparis, Lupini, Satureia, Thymus; Arbores quonque & macilentum solum amant; itemque frutices plerique. Hujusmodi arbores sunt, Pomus, Pyrus, Cerasus, Prunus, Persica, Cotonea, Morus, Juglans, Corylus, Staphyloedrum, Mespilus, Ornus, Castanea, &c. Frutices, scilicet Vitis, Berberis, Genista, Juniperus, Oxyacantha, Perilymenum, Rosa, Ribesum, Uva, Spina, Vaccinia, &c.*

34. But here also we must distinguish, that *Pears* will bear in a very *stony*, *hungry*, *gravelly* land, such as *Apples* will not bear in; and I have seen *Pears* bear in a tough binding hungry *Clay*, when *Apples* could not so well bear it (as the smooth rinds of the *Pear-trees*, and the *Mossie* and *canker'd rinds* of the *Apple trees* did prove) the *root* of a *Pear-tree* being it seems more able to pierce a stony and stiff ground. And *Cherries*, *Mulberries*, and *Plums* can rejoice in a richer soil, though by the smallness of the *Roots*, the shallower soil will suffice them. And the *Quinces* require a deeper ground, and will bear with some degrees of hungry land, if they be supplied with a due measure of *succulency*, and neighboring moisture; and the other *shrubs*, according to the smallness of their *roots*, do generally bear a thinner land. I have seen a *soil* so much too rank for *Apples* as *Plums*, that all their fruits from year to year were

always *worm-eaten*, till their lives were forfeited to the fire.

35. To take up from these *Curiosities*, the most useful result to our purpose; we have always found these *Orchards* to grow best, last longest, and bear most, which are frequently tilled for *Barley*, *Wheat*, or other *Corn*, and kept (by *Culture* and *seasonable rest*) in due strength to bear a full *crop*. And therefore, whereas the *Red-frake* might otherwise without much injury be planted at fifteen or twenty foot distance, and the best distance for other *Cider-fruit* hath heretofore been reputed *thirty*, or *two and thirty* foot; very good husbands do now allow in their largest *Inclosures* (as of 20, 40 or 100 Acres) fifty or sixty foot distance, that the Trees may not much hinder the *Plow*, and yet receive the benefit of *Compost*; and a *Horseteem* well governed will (without any damage of danger) *plow* close to the Trees.

36. In such soil as is here required, namely of good *Tillage*, an Orchard of grafted *Red-frakes* will be of good growth, and good burthen, within *ten* or *twelve* years, and branch out with good store to begin an encouragement at three years *grafting*; and (except the land be very unkind) will not yield to any decay within *sixty* or *eighty* years, which is a *man's* age.

37. In some *sheets* I rendered many Reasons against Mr. *Austin* of *Oxford*, why we should prefer a peculiar *Cider-fruit*, which in *Herefordshire* are generally called *Musts*; (so we name both the *Apple* and the *Liquor*, and *Pulse* as mingled together in the confusion) as from the *Latine Mustum*. *White-Musts* of divers kinds, *Red-cheek'd* and *Red-break'd Musts* of several kinds, *Green-Musts* called also *Green-fillet*, and *Blew-spotted*: Why, I say, we should prefer them for *Cider*, before *Table-fruits*, as *Pepins*, *Pearmains*, &c. And I do still insist on them: 1. The *Liquor* of these *Cider-fruits* and of many kinds of austere fruit, which are no better than a sort of full succulent *Crabs*, is more sprightly, brisk and *winy*. For *Essay*, I sent up many *bottles* to *London*, that did me no discredit. Secondly, One bushel of the *Cider-fruit* yields twice or thrice as much liquor. Thirdly, The *Tree* grows more in three or four years than the others in ten years, as I oft times remarked. Fourthly, The *Tree* bears far greater store, and doth more generally escape *Blights* and *Frosts* of the *Spring*. I might add, that some of these, and especially such *Pears* as yield the best *Perry*, will best escape the hand of the *Thief*, and may be trusted in the open field.

38. By the *first*, *second* and *fourth* of these Reasons, I must exclude the *Gennet-Moyle* from a *right Cider-fruit*, it being dry and very apt to take *frosty blights*; yet it is no *Table-fruit*, but properly a baking fruit, as the ruddy colour from the *Oven* shews.

39. I said that the *right Cider-fruit* generally called *Musts*, and deserving the *Latine* name *Mustum*, is of divers kinds; and I have need to note more expressly that there is a *Red-frak'd Must* (as I have often seen) but not generally known, that is quite differing from the famous *Red-frake*, being much less, somewhat oblong and like some of the white *Musts* in shape, and full of a very good *winy* liquor. I could willingly name the *persons* and *place* where the

the distinct kinds are best known: it was first shewed me by *John Nash* of *Asperton* in *Herefordshire*; and for some years they did in some places distinguish a *Red-frake*, as yielding a richer *Red-frak'd Cider* of a more *fulvous* or *ruddy* colour; but this difference, as far as I could find, is but a choice of a better *insolated* or *ruddy* fruit of the best kind, as taken from the *South* part of the *Tree*, or from a *soil* that renders them richer. But my Lord *Scudamore's* is safely of the best sort; and Mr. *Whingate* of the *Grange* in *Dimor*, and some of *King's-capel*, do best know these and other differences, *Straked-Must*, *right Red-frake*, *red Red-frake*, &c.

40. The greenish *Must*, (formerly called in the *Language* of the *Country*, the *Green-fillet*) when the *Liquor* is of a kindly ripeness, retains a *greenness* equal to the *Rhenish-glass*; which I note for them that conceive no *Cider* to be fit for use till it be of the colour of *old sack*.

41. To direct a little more *caution*, for enquiry of the *right Red-frake*, I should give notice that some *Months* ago, Mr. *Philips* of *Mountague* in *Somersetshire*, shewed me a very fair large *Red-frake Apple*, that by smell and sight seemed to me and to another of *Herefordshire* then with me to be the best *Red-frake*; but when we did cut it, and taste it, we both denied it to be *right* (the other with much more confidence than my self) but Mr. *Philips* making *Cider* of it, this week invited me to it, assuring that already it equals or resembles *High country-Wines*. It had not such plenty of juice as our *Red-frakes* with us, and it had more of the pleasantness of *Table-fruit*, which might be occasioned, for ought I know, by the purer and quicker soil. This *Apple* is here call'd *Meriot-Tinot*, and great store of them are at *Meriot*, a *Village* not far distant: Possibly, this *Meriot* may prove to be the *Red-frake* of *Somersetshire*, when they shall please to try it apart with equal diligence and constancy as they do in *Herefordshire*: This *fruit* is of a very lovely *bue*, and by some conceived to be of affinity to the *Red-Jersey-Apple*, which is reported to *tinge* so deeply: In truth, there can hardly be a deeper *Purple*, than is our *right Herefordshire Red-frake*, having a few *streaks* towards the *Eye*, of a *dark* colour, or *Orange-tawny* intermingled: But, 'tis no wonder if an *Apple* should change its *Name* in travelling so far beyond the *Severn*, when even in this *Country*, most sorts of *Apples*, and especially, *Cider-fruit*, loſeth the *Name* in the next *Village*.

42. I may now ask why we should talk of other *Cider-fruit* or *Perry*, if the best *Red-frake* have all the aforesaid pre-eminences of richer and more *winy* liquor, by half sooner an Orchard, more constantly bearing, &c. An Orchard of *Red-frakes* is commonly as full of fruit at *ten* years, as other *Cider-fruit* at *twenty* years, or as the *Pepin* and *Pearmain* at *thirty* or thereabout.

43. To this may be Answered, that all *soils* bear not *Apples*, and to some *soils* other *Apples* may be more kind, and if we be driven to *Perry*, much we may lay both in behalf of the *Perry*, and of the *Pear*, of the *fruit*, and of the *Tree*; It is the goodlier *Tree* for a *Grove*, to shelter a house and walks from *Summers heat* and *Win-*

ters cold Winds, and far more lasting; the pleasantest *Cider-pear* of a known name amongst them, is the *Horfe-pear*. And it is much argued, whether the *White-horfe-pear*, or the *Red-horfe-pear* be the better; where both are best, within two Miles they differ in judgment. The *Pear* bears almost its weight of sprightly *winy Liquor*; and I always preferred the *tawny* or *ruddy Horfe-pear*, and generally that colour in all *Pears* that are proper for *Perry*.

44. I rejected *Palladius* against the durableness of *Perry*; his words are, *Hyeme durat, sed primâ acescit æstate, Tit. 25. Febr.* possibly so of common *Pears*, and in hotter Countries; but from good *Cellars* I have tasted a very brisk lively and *winy liquor* of these *Horfe-pears* during the end of *Summer*; and a *Bosbury-pear* I have named and often tried, which without bottling, in common *Hog-heads* of vulgar and indifferent *Cellars*, proves as well pleasanter as richer the *second* year, and yet also better the *third* year. A very honest, worthy and witty *Gentleman* of that neighbourhood would engage to me, that in good *Cellars*, and in careful custody, it passeth any account of decay, and may be heightened to a kind of *Aqua-vitæ*. I take the information worthy the *style* of our modern improvements.

The *Pear-tree* grows in common fields and wild stony ground; to the largeness of bearing one, two, three or four *Hog-heads* each year.

45. This *Bosbury-tree*, and such generally that bear the most lasting *Liquor* and *winy*, is of such unsufferable taste, that hungry *Swine* will not smell to it; or if hunger tempt them to taste, at first crush they shake it out of their mouths; (I say not this of the *Horfe-pear*) and the *Clowns* call other *Pears*, of best *Liquor*, *Choak-pears*, and will offer money to such as dare adventure to taste them, for their sport; and their mouths will be more stupified than at the root of *Wake-robin*.

46. A row of *Crab-trees* will give an improvement to any kind of *Perry*; and since *Pears* and *Crabs* may be of as many kinds as there are kernels, or different kinds or mixtures of soils; in a general Character I would prefer the largest and fullest of all austere juices.

47. Mr. *Lill* of *Mark-hill* (aged about 90 years) ever observed this Rule, to graft no wild *Pear-tree* till he saw the fruit; if it proved large, juicy, and brisk, it failed not of good *Liquor*. But I see cause to say, that to graft a young tree with a riper graft, and known excellency, is a sure gain and hastens the return.

48. Mr. *Speke* (last high Sheriff of *Somersetshire*) shewed me in his Park some store of *Crab-trees*, of such huge Bulk, that in this fertile year he offered a wager, that they would yield one or two *Hog-heads* of *Liquor* each of them; yet were they small dry *Crabs*.

49. I have seen several sorts of *Crabs* (which are the natural *Apple*, or at worst but the *Wild-Apple*) which are as large as many sorts of *Apples*, and the *Liquor winy*.

50. I have disclaimed the Gist of *Juniper-berries* in *Cider*; I tried

tried it only once for my self, and drank it before *Christmas*: possibly in more time the relish had been subdued or improved, as of *Hops* in *stale Beer*, and of *Rennet* in good *Farinasan*. Neither was the Gist to me otherwise unpleasant than as *Annis-seeds* in *Bread*, rather strange than odious; and by custom made grateful, and it did hasten the clarification, and increase the briskness to an endless sparkling: thus it indulgeth the Lungs, and nothing more cheap; where *Juniper* grows, a Girl may speedily fill her lap with the *Berries*.

If *Barbadoes* *Ginger* be good, cheaper, and a more pleasant preserver of *Beer*, it must probably be most kind for *Cider*: For first, of all the improvers that I could name, bruised *Mustard* was the best; and this *Ginger* hath the same quick, mordicant vigour, in a more noble and more *Aromaticque* fragrance. Secondly, *Cider*, (as I oft complain) is of a sluggish and somewhat windy nature; and for some Months the best of it is chain'd up with a cold ligature, as we fancy the fire to be lock'd up in a cold *Flint*. This will relieve the prisoner. And thirdly, will assist the *winy* vigour for them that would use it instead of a sparkling *Wine*. Fourthly, 'Tis a good sign of much kindness, and great friendship: it will both enliven the ferment for speedier maturity, and also hold it out for more duration, both which offices it performs in *Beer*.

51. *Cider* being windy before maturity, some that must not wait the leisure of best season do put sprigs of *Rosemary* and *Bays* in the Vessel; the first good for the head, and not unpleasant; the second, an Antidote against Infections; but less pleasant till time hath incorporated the Tastes.

52. And why may we not make mention of all these Mixtures, as well as the Ancients of their *Vinum Marrubii*, *Vinum Abrotanites*, *Absynthites*, *Hyssopites*, *Marathites*, *Thymites*, *Cydonites*, *Myrtites*, *Scillites*, *Violaceum*, *Sorbi*, &c.

53. And, for mixtures, I think we may challenge the Ancients, in naming the *Red-rasp*; of which there is in this County a Lady that makes a *Bonella*, the best of *Summer drinks*. And more yet if we name the *Glove-july-flower*, or other *july-flowers*, a most grateful *Cordial*, as it is infused by a Lady in *Staffordshire*, of the Family of the *Devereux's*, and by some Ladies of this Country.

54. I could also give some account of *Cherry wine*, and *Wine of Plums*; the last of which (in the best Essay that I have yet seen) is hardly worthy to be named: But, I conceive, and have ground for it, that some good *Liquor* and *spirits* may be drawn from some sorts of them, and in quantity: And the vast store of *Cherrys* in some places, under a penny the pound, and of *Plums* that bend the Trees with their burdens, and their expedite growth makes it cheap enough; and as in the other, so in these, the large *English* or *Dutch* sharp *Cherry*, makes the *Cherry-wine*; and the full black, tawny *Plum*, as big as a *Walnut* (not the kind of *Heart-Cherries*, nor the *Plum* which divides from the stone) make the *Wine*. Their cheapness should recommend them to more general use at *Tables*, when dried like *Prunellas* (an easie art) and then wholsomer.

55. To return for *Red-strake*; 'tis a good drink as soon as well fermented, or within a *Month*, better after some *Frost*, and when clarified; rich *Wine*, when it takes the colour of old *Sack*. In a good *Cellar* it improves in *Hogheads* the second year; in *Bottles* and *sandy Cellars* keeps the *Records* of late revolutions and old *Majoralities*. *Quere* the manner of laying them up in *sand-houses*.

56. I tried some *Bottles* all the *Summer* in the bottom of a *Fountain*; and I prefer that way where it may be had. And 'tis somewhat strange if the Land be neither dry for a *sand-house*, nor *fountainous* for this better expedient. When *Cider* is sett'd, and altogether, or almost clarifi'd, then to make it *sprightly* and *winy*, it should be drawn into well cork'd and well bound *bottles*, and kept some time in *sand* or water; the longer the better, if the kind be good. And *Cider* being preserved to due age, bottl'd (and kept in cool places, *conservatories*, and *refrigerating* springs) it does almost by time turn to *Aqua-vita*; the *Bottles* smoak at the opening, and it catches *flame* speedily, and will burn like *Spirit of Wine*, with a fiery taste; and it is a laudable way of trying the vigour of *Cider* by its promptness to burn, and take *fire*, and from the quantity of *Aqua-vita* which it yields. *Cider* affords by way of *Distillation*, an incomparable and useful *Spirit*, and that in such plenty, as from four *Quarts*, a full *Pint* has been extracted.

57. I must not prescribe to other *Palats*, by asserting to what degree of *Perfection* good *Cider* may be raised, or to compare it with *Wines*: But when the late *King* (of blessed memory) came to *Hereford* in his distress, and such of the *Gentry* of *Worcestershire* as were brought thither as *Prisoners*; both *King*, *Nobility*, and *Gentry*, did prefer it before the best *Wines* those parts afforded; and to my knowledge that *Cider* had no kind of *Mixture*. Generally all the *Gentry* of *Herefordshire* do abhor all mixtures.

Yet if any man have a desire to try *conclusions*, and by an harmless *Art* to convert *Cider* into *Canary-wine*; let the *Cider* be of the former year, *Masculine* and in full body, yet pleasant and well tasted: into such *Cider* put a *spoonful*, or so, of the *Spirit of Clary*, it will have so much of the race of *Canary*, as may deceive some who pretend they have discerning *Palats*.

Sir

Sir PAUL NEIL'S
DISCOURSE
OF
CIDER.

My Lord,

I N obedience to the *Commands* of this *Honourable Society*, I have at length endeavoured to give this brief *Account* of that little which I know concerning the *Ordering* of *Cider*; and in that I shall propound to my self six things.

First, To shew that *Cider* made of the best *Eating-Apples* must needs be once the best; (that is to say) the pleasantest *Cider*.

Secondly, That hitherto the general opinion hath been otherwise, and that the reason of that mistake was the not apprehending the true cause why the *Pepin-cider*, &c. did not retain its sweetness, when the *Hard-apple-cider* did.

Thirdly, What is the true cause that *Pepin-cider*, used in the ordinary method, will not retain its sweetness.

Fourthly, How to cure that evil in *Pepin-cider*.

Fifthly, A probable conjecture how in some degree by the same Method to amend the *Hard-apple-cider*, and *French-Wine*.

Sixthly, That what is here propounded cannot chuse but be wholesome, and may be done to what degree every mans *Palate* shall wish.

Having now told your *Lordship*, what I will endeavour to do before I enter upon it, I must declare what I will not in the least pretend to do.

1. I do not pretend to any thing concerning the *planting* and *grafting* of *Trees*, &c.

Nor what *Trees* will soonest bear or last longest.

Nor what *sorts* of *Trees* are the best bearers, and may with least danger grow in common fields.

Nor what *sort* of *fruit* will yield the greatest store of *Cider*.

Nor what *Cider* will keep the longest, and be the strongest, and wholesomest to drink constantly with meat.

The only thing I shall endeavour being to prescribe a way to make a sort of *Cider* pleasant and quick of taste, and yet wholesome

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som to *drink*, sometimes, and in a moderate proportion: For, if this be an *Hereſe*, I muſt confeſs my ſelf guilty; that I prefer *Canary-wine*, *Verdea*, the pleaſanteſt *Wines* of *Greece*, and the *High-country-wines* before the *harſh Sherries*, *Vin de Hermitage*, and the *Italian* and *Portugal* rough *Wines*, or the beſt *Graves-wines*; not at all regarding that I am told, and do believe, that theſe *harſh wines* are more comfortable to the *ſtomach*, and a *Surfeit* of them leſs *noxious*, when taken; nor to be taken but with drinking greater quantities than can with ſafety be taken of thoſe other pleaſant *Wines*: I ſatisfying my ſelf with this, that I like the *pleaſant Wines* beſt; which yet are ſo wholeſom, that a man may drink a moderate quantity of them without prejudice.

Nor ſhall I at all concern my ſelf, whether this ſort of *Cider* I pretend to is ſo *vinous* a liquor; and conſequently will yield ſo much *ſpirit* upon *Diſtillation*, or ſo ſoon make the *Country-man* think himſelf a *Lord*, as the *Hard-apple-cider* will do: nor whether it will laſt ſo long; for it is no part of my *deſign* to perſwade the *World* to lay by the making of *Hard-apple-cider*; but rather in a degree to ſhew how to improve that in point of pleaſantneſs, and that by the making and rightly ordering of *Cider* of the beſt *Eating-Apples*, as *Golden-pippins*, *Kentish-pippins*, *Pear-mains*, &c. there may be made a more pleaſant liquor for the time it will laſt, than can be produced from thoſe *Apples* which I call *Hard-Apples*, that is to ſay, *Red-ſtrakes*, *Gennet-moyles*, the *Brombury-Crab*, &c. which are ſo *harſh* that a *Hog* will hardly eat them.

Nor ſhall I at all meddle with the making of *Perry*, or of any mixed drink of the juyce of *Apples* and *Pears*; though poſſibly what I ſhall ſay for *Cider* may be aptly applied to *Perry* alſo.

For the *firſt* particular, I aſſerted that the beſt *Apples* would make the pleaſanteſt, which in my ſence is the beſt *Cider*; (and I account thoſe the beſt *Apples*, whoſe juyce is the pleaſanteſt at the time when firſt preſſed, before fermentation) I ſhall need (beſides the experience of the laſt ten years) only to ſay, that it is an undeniable thing in all *Wines*, that the pleaſanteſt *Grapes* make the richeſt and pleaſanteſt *Wines*; and that *Cider* is really but the *Wine* of *Apples*, and not only made by the ſame way of *Compreſſion*; but left to it ſelf hath the ſame way of *Fermentation*; and therefore muſt be liable to the ſame meaſures in the choice of the materials.

To my ſecond *Aſſertion*, that this truth was not formerly owned, by reaſon that in *Herefordſhire*, and thoſe Countries where they abound both with *Pippins* and *hard-apples* of all ſorts, they made *Cider* of both ſorts, and uſed them alike; that is, that as ſoon as they ground and preſſed the *Apples* and ſtrained the *Liquor*, they put it into their *Veſſels*, and there let it lye till it had wrought; and afterwards was ſetled again and *fined*; as not thinking it wholeſom to drink till it had thus (as they call it) *purg'd* it ſelf, and this was the frequent uſe of moſt men in the more *Southern* and *Western* parts of *England* alſo. Now when *Cider* is thus uſed,

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it is no wonder that when they came to broach it, they for the moſt part found their *Pepin-cider* not ſo pleaſant as their *Moyle* or *Red-ſtrake-cider*; but to them it ſeemed a wonder, becauſe they did not know the *reaſon* of it (which ſhall be my next work to make out) for till they knew the *reaſon* of this *effect*, they had no cauſe but to think it was the nature of the ſeveral *Apples* that produced it; and conſequently to prefer the *Hard-apple-cider*, and to uſe the other *Apples* (which were good to eat raw) for the *Table*: which was an uſe not leſs neceſſary, and for which the *hard-apples* were totally improper.

To my *third* Aſſertion, which is, that in *Herefordſhire* they knew not what was the true cauſe why their *Pepin-cider* (for by that name I ſhall generally call all ſorts of *Cider* that is made of *Apples* good to eat raw) was not, as they uſed it, ſo good as the *Cider* made of *hard-apples* (for by that name, for brevities ſake, I ſhall call the *Cider* of *Moyle*, *Red-ſtrake*, and all other ſorts of *harſh Apples*, not fit to eat raw.) Firſt, I ſay, for all *liquors* that are *vinous*, the cauſe that makes them ſometimes harder or leſs pleaſant to the taſte, than they were at the firſt preſſing, is the too much *fermenting*: If *Wine* or *Cider* by any *accidental* cauſe do ferment twice, it will be harder than if it had fermented but once; and if it ferment thrice, it is harder and worſe than if it had fermented but twice: and ſo onward, the oftener it ferments and the longer it ferments, it ſtill grows the harder. This being laid as a *foundation*, before we proceed further we muſt firſt conſider what is the cauſe of fermentation in *Wine*, *Cider*, and all other *Vinous Liquors*. Which (in my poor opinion) is the groſs part of the *Liquor*, which ſcapes in the ſtraining of the *Cider* (for in making of *Wine* I do not find that they uſe the curioſity of ſtraining) and which is generally known by the name of the *Lee* of that (*Wine* or) *Cider*. And this *Lee* I ſhall, according to its thickneſs of parts, diſtinguiſh into the *groſs Lee*, and the *ſtinking Lee*.

Now, according to the old method of making and putting up of *Cider*, they took little care of putting up only the clear part of the *Cider* into their *Veſſels* or *Cask*; but put them up thick and thin together, not at all regarding this *ſeparation*; for experimentally they found that how thick ſoever they put it up, yet after it had thoroughly wrought or fermented and was ſetled again, it would ſtill be clear; and perchance that which was put up the ſoonest after it was preſſed and the thickeſt, would, when the fermentation was over, be the cleareſt, the brikeſt, and keep the longeſt. This made them confidently believe that it was not only not inconvenient to put it up quickly after the preſſing, but in ſome degree neceſſary alſo to put it up ſoon after the preſſing, ſo that it might have ſo much of the *Lee* mixed with it, that it might certainly, ſoon, and ſtrongly put it into a fermentation, as the only means to make it *wholſom*, *clean* and *briſk*; and when it either did not (or that they had reaſon to doubt that it would not) work or ferment ſtrongly enough, they had uſed to put in

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Mustard or some other thing of like nature to increase the fermentation.

Now that which in *Cider* of *Pepins* hath been a cause of greater fermentation than in *Cider* of *Hard-Apples*, being both used after the former method, is this, that the *Pepins* being a softer fruit are in the *Mill* bruised into smaller particles than the harder sorts of *Apple*; and consequently more of those small parts pass the strainer in the *Pepin-cider* than in the *Cider* of *Hard-apples*, which causeth a stronger fermentation, and (according to my former principle) a greater loss of the native sweetness than in that of *Hard-apple-cider*; and not only so, but the *Lee* of the *Hard-apple-cider* being compounded of greater particles than the *Lee* of the *Pepin-cider*, every individual particle is in itself of a greater weight than the particles of the *Lee* of the *Pepin-cider*; and consequently less apt to rise upon small motions, which produceth this effect; that when the fermentation of the *Hard-apple-cider* is once over, unless the Vessel be stirred, it seldom falls to a second fermentation; but in *Pepin-cider* it is otherwise: For if the gross *Lee* be still remaining with the *Cider*, it needs not the motion of the Vessel to cause a new fermentation, but every motion of the *Air* by a change of weather from dry to moist will cause a new fermentation, and consequently make it work till it hath destroyed itself by losing its native sweetness. And this alone hath been the cause, why commonly when they broach their *Pepin-cider* they find it so unpleasant, that generally the *Hard-apple-cider* is preferred before it, although at first it was not so pleasant as the *Pepin-cider*. Yet after this mischief hath prevailed over the *Pepin-cider*, it is no wonder to find the *Hard-apple-cider* remaining not only the stronger, but even the more pleasant tasted. This to me seems satisfactory for the discovery of the cause, why in *Herefordshire* the *Hard-apple-cider* is preferred before the *Pepin-cider*. But perhaps it may by some be objected, that they have before the ten years, in which you pretend you found this to be the cause of spoiling the *Pepin-cider*, been in *Herefordshire*, and tasted the best *Cider* that Country did afford; and yet it was not like the *Pepin-cider* they had before then tasted in other parts. To this I do answer, at present, briefly, that by some mistake, or chance, the maker of this *Pepin-cider*, which proved good, had done that, or somewhat like that, which under the next Assertion I shall set down, as a Method to cure the inconveniences which happen to *Pepin-cider*, by the suffering it to ferment too often, or too strongly; but till that be explained it would be improper to shew more fully what these particular accidents might possibly be, which (without the intention of those persons which made the *Cider*) caused it to prove much better than their expectation, or indeed better than any could afterwards make: they possibly assigning the goodness of that *Cider* to somewhat that was not really the cause of that effect.

To justify my fourth Assertion, and shew a Method how to cure the inconveniency which happens to *Pepin-cider* by the over-working,

ing, I must first take notice of some things which I have been often told concerning *Wine*, and which indeed gave me the light to know what was the cause which had made *Pepin-cider* that had wrought long, *bard* when it came to be clear again. The thing I mean, is, that in divers parts, and even in *France* they make three sorts of *Wine* out of one and the same *Grapes*; that is, they first take the juice of the *Grapes* without any more pressing than what comes from their own weight in the *Vat*, and the bruising they have in putting into the Vessel, which causeth the ripest of those *Grapes* to break, and the juice without any pressing at all makes the pleasantest and most delicate *Wine*: And if the *Grapes* were red, then is this first *Wine* very pale. The second sort they press a little, which makes a redder *Wine*, but neither so pleasant as the first, nor so harsh as the last, which is made by the utmost pressing of the very skins of the *Grapes*, and is by much more harsh, and of deeper colour than either of the other two. Now I presume the cause of this (at least in part) to be, that in the first sort of *Wine*, which hath little of the substance, beside the very juice of the *Grape*, there is little *Lee*, and consequently little fermentation; and because it doth not work long, it loseth but little of the original sweetness it had: The second sort being a little more pressed hath somewhat more of the substance of the *Grape* added to the juice; and therefore having more of that part which causeth fermentation put with it, ferments more strongly, and is therefore, when it hath done working, less pleasant than the first sort, which wrought less. And for the same reason the third sort being most of all pressed, hath most of the substance of the *Grape* mingled with the *Liquor*, and worketh the longest: but at the end of the working when it settles and is clear, it is much more harsh than either of the two first sorts. The thought of this made me first apprehend that the substance of the *Apple* mingled with the juice, was the cause of fermentation, which is really nothing else but an endeavour of the *Liquor* to free it self from those heterogeneous parts which are mingled with it: And where there is the greatest proportion of those dissimilar parts mingled with the *Liquor*, the endeavour of Nature must be the stronger, and take up more time to perfect the separation: which when finished leaves all the *Liquor* clear, and the gross parts settled to the bottom of the Vessel; which we call the *Lee*. Nor did this apprehension deceive me; for when I began (according to the Method which I shall hereafter set down) to separate a considerable part of the *Lee* from the *Cider* before it had fermented, I found it to retain a very great part of its original sweetness, more than it would have done if the *Lee* had not been taken away before the fermentation; and this not once, but constantly for seven years.

Now the Method which I used, was this: When the *Cider* was first strained, I put it into a great *Vat*, and there let it stand twenty four hours at least (sometimes more, if the *Apples* were more ripe than ordinary) and then at a tap before prepared in the Vessel three or four inches from the bottom I drew it into pails, and from thence

thence filled the *Hoghead* (or lesser *Vessel*) and left the greatest part of the *Lee* behind; and during this time that the *Cider* stood in the *Vat*, I kept it as close covered with *hair-cloths* or *sacks* as I could; that so too much of the *spirits* might not evaporate.

Now possibly I might be asked why I did not, since I kept it so close in the *Vat*, put it at first into the *Vessel*; To which I answer, that had I put it at first into the *Vessel*, it would possibly (especially if the *weather* had chanced to prove wet and warm) have begun to *ferment* before that time had been expired; and then there would have been no possibility to have separated any part of the *gross Lee*, before the *fermentation* had been wholly finished; which keeping it only covered with these cloths was not in danger: For, though I kept it warm in some degree, yet some of the *spirits* had still liberty to *evaporate*; which had it been in the *Hoghead* with the *Bung* only open, they would not so freely have done; but in the first 24 hours it would have begun to *ferment*, and so my design had been fully lost: For those *spirits* if they had been too strongly *reverberated* into the *Liquor*, would have caused a *fermentation* before I could have taken away any part of the *gross Lee*. For the great *mystery* of the whole thing lies in this, to let so many of the *spirits* evaporate, that the *liquor* shall not *ferment* before the *gross Lee* be taken away; and yet to keep *spirits* enough to cause a *fermentation* when you would have it. For if you put it up as soon as it is *strained*, and do not let some of the *spirits* evaporate, and the *gross Lee* by its weight only to be separated without *fermentation*, it will *ferment* too much and lose its sweetness; and if none be left, it will not *ferment* at all; and then the *Cider* will be dead, flat and sour.

Then after it is put into the *Vessel*, and the *Vessel* fill'd all but a little (that is, about a *Gallon* or thereabout) I let it stand (the *Bung-hole* being left only covered with a *paper*, to keep out any dust or filth that might fall in) for 24 hours more; in which time the *gross* part of the *Lee* being formerly left in the *Vat*, it will not *ferment*, but you may draw it off by a *Tap* some two or three inches from the bottom of the *Vessel*, and in that second *Vessel* you may stop it up, and let it stand safely till it be fit to *Bottle*; and possibly that will be within a day or more: but of this time there is no certain measure to be given; there being so many things that will make it longer, or less while before it be fit to *bottle*. As for *Example*, If the *Apples* were *over-ripe* when you stamped them, or ground them in the *Mill*, it will be the longer before it will be clear enough to *Bottle*; or if the *weather* prove to be warmer or moister than ordinary: or that your *Apples* were of such kinds, as with the same force in the stamping or grinding they are broken into smaller particles than other *Apples* that were of harder kinds.

Now, for knowing when it is fit to *Bottle*, I know no certain *Rule* that can be given, but to *broach* the *Vessel* with a small *Piercer*, and in that *hole* fit a *peg*, and now and then (two or three times in a day) draw a little, and see what fineness it is of; for when it is *bottled* it must not be perfectly *fine*; for if it be so, it will not *set* in the

the *bottle*, which gives it a fine quickness, and will make it *mantle* and *sparkle* in the *glass*, when you pour it out: And if it be too thick when it is *bottled*, then, when it hath stood some time in the *bottles* it will *ferment* so much that it may possibly either drive out the *Corks*, or break the *bottles*, or at least be of that sort (which some call *Potgun-drink*) that when you open the *bottles* it will fly about the house, and be so *windy* and *cutting* that it will be inconvenient to drink: For the right *temper* of *Bottle-Cider* is, that it *mantle* a little and *sparkle* when it is put out into the *glass*; but if it *froth* and *fly*, it was *bottled* too soon: Now the *temper* of the *Cider* is so nice, that it is very hard when you *bottle* it to foretel which of these two conditions it will have: but it is very easie within a few days after (that is to say, about a week, or so) to find its *temper* as to this point. For first, if it be *bottled* too soon; by this time it will begin to *ferment* in the *Bottles*, and in that case you must open the *Bottles*, and let them stand open two or three minutes, that that abundance of *spirits* may have *Vent*, which otherwise kept in would in a short time make it of that sort I called before *Potgun-drink*; but being let out, that danger will be avoided, and the *Cider* (without danger of breaking the *bottles*) will *keep* and *ferment*, but not too much. Now this is so easie a *remedy*; that I would advise all men rather to err on the hand of *bottling* it too soon, than let it be too *fine* when they *bottle* it; for if so, it will not *set* in the *bottle* at all; and consequently, want that *briskness* which is desirable.

Yet even in this case there is a *Remedy*, but such a one as I am always very careful to avoid, that so I may have nothing (how little soever) in the *Cider* but the *juice* of the *Apple*: But the *remedy* is, in case you be put to a necessity to use it, that you open every *bottle*, after it hath been *bottled* about a week or so, and put into each *bottle* a little piece of *white sugar*, about the bigness of a *Nutmeg*, and this will set it into a little *fermentation*, and give it that *briskness* which otherwise it would have wanted. But the other way being full as easie, and then nothing to be added but the *juice* of the *Apple* to be simply the substance of your *Cider*, I chuse to prefer the error of being in danger to *bottle* the *Cider* too soon, rather than too late: Nay sometimes in the *bottling* of one and the same *Hoghead* (or other *Vessel*) of *Cider*, there may the first part of it be too *fine*; the second part *well*; and the last not *fine* enough: and this happens when it is *broached* first above the *middle*, and then below; and then when it begins to run low, *tilted* or raised at the further end, and so all drawn out. But to avoid this inconvenience, I commonly set the *bottles* in the order they were filled, and so we need not open all to see the condition of the *Cider*; but trying one at each end, and one in the middle, will serve the turn: And to prevent the inconveniency, *broach* not at all above the *middle*, nor too low; and when you have drawn all that will run at the *Tap*, you may be secure it is so far of the same *temper* with the first *bottle*. And then *tilt* the *Vessel*; but draw no more in three or four hours at the least after, and set them by themselves, that so, if you please, you

you may three or four days after pour them off into other *bottles*, and leave the *gross* behind: And by this means though you have a less number of *bottles* of *Cider* than you had, yet this will continue good, and neither beapt to *fly*, nor have a *sediment* in the *bottle*, which after the first *glass* is filled will render all the rest of the *bottle* thick and muddy.

By all this which I have said, I think it may be made out that those persons which I mentioned in the end of the last *Paragraph*, that sometimes had *Pepin-cider* better than ordinary, and indeed than they could make again, were beholding to *chance* for it; either that their *Apples* were not so full ripe at that as at other times, and so not bruised into so small parts; but the *fermentation* was ended in the *Vessel*, and the *Lee* being then *gross* settled before the *Cider* had *fermented* so long as to be hard.

Or else, by some *Accident* they had not put it so soon into the *Vessel*, but that in part it was settled before they put it up, and the grossest part of the *Lee* left out of the *Vessel*.

Or else, the *Bung* being left open some part of the *spirits* evaporated; and that made the *fermentation* the weaker, and to last the less time.

Or else, they put it up in such a *season* that the *weather* continued cold and *frosty* till the *fermentation* was quite over; and then it having wrought the less time, and with the less violence, it remained more pleasant and rich than otherwise it would have done.

Now for the time of making *Pepin-cider*, I chuse to do it in the beginning of *November*, after the *Apples* had been gathered and laid about three weeks or more in the *loft*, that so the *Apples* might have had a little time to *sweat* in the house before the *Cider* was made, but not too much; for if they be not full ripe before they be gathered, and not suffered to lie a while in the *heap*, the *Cider* will not be so pleasant; and if they be too ripe when they are gathered, or lye too long in the *heap*, it will be very difficult to separate the *Cider* from the *gross Lee* before the *fermentation* begins: and in that case it will work so long, that when it *finer*, the *Cider* will be hard; for when the *Apples* are too *mellow*, they break into so small *Particles*, that it will be long before the *Lee* settles by its *weight* only: and then the *fermentation* may begin before it be separated, and so destroy your intention of taking away the *gross Lee*. And if the *Apples* be not *mellow* enough, the *Cider* will not be so pleasant as it ought to be.

This being said for the time of making the *Pepin-Cider*, may (*mutatis mutandis*) serve for all other sorts of *Summer-fruit*; as the *Kentish-codling*, *Marigolds*, *Gilly-flowers*, *Summer-pear-mains*, *Summer-pepins*, *Holland-pepins*, *Golden-pepins*, and even *Winter-pear-mains*. For though they must not be made at the same time of the year, yet they must be made at the time when each respective fruit is in the same condition that I before directed that the *Winter-pepin* should be. Nay, even in the making of that *Cider*, you are not tied to that time of the year to make your *Cider*; but as the condition of that particular year hath been, you may make your

your *Cider* one, two, three or four weeks later; but it will be very seldom that you shall need to begin to make *Kentish-pepin-Cider* before the beginning of *November*, even in the most southern parts of *England*.

The next thing I shall mention, is, the ordering of your *bottles* after they are filled; for in that consists no small part of causing your *Cider* to be in a just condition to *drink*: For, if it does *ferment* too much in the *bottle*, it will not be so convenient to *drink*, neither for the taste, nor whollesomeness; and if it *ferment* not at all, it will want that little *frez* which makes it *grateful* to most *Palates*. In order to this, you must observe, first, whether the *Cider* were bottled too early, or too late, or in the just time: If too early, and that it hath too much of the *flying Lee* in it, then you must keep it as cool as you can, that it may not work too much, and if so little that you doubt it will not work at all, or too little; you must by keeping it from the inconvenience of the external air, endeavour to hasten and increase the *fermentation*. And this I do, by setting it in sand to cool, and by covering the *bottles* very well with *straw*; when I would hasten or increase the *fermentation*.

And if I find the *Cider* to have been bottled in its just time, then I use *neither*, in ordinary weather; but content my self that it stands in a close and cool *Cellar*, either upon the *ground*, or upon *shelves*; saving in the time that I apprehend *frost*, I cover it with *straw*, which I take off as soon as the *weather* changeth; and consequently about the time that the cold *East winds* cease; which usually with us, is in the beginning of *April*; I let my *bottles* into sand up to the necks. And by this means I have kept *Pepin-cider* without change till *september*, and might have kept it longer, if my store had been greater: For by that time the heats were totally over, and consequently, the cause of the turn of *Cider*.

Having now declared what is (according to my opinion) to be done to preserve *Cider*, if not in its original sweetness, yet to let it lose as little as is possible; I shall now fall upon my fifth *Affertion*, which is, that it is probable that somewhat like the former *Method* may in some degree mend *Hard-Apple-cider*, *Perry*, or a drink made of the mixtures of *Apples* and *Pears*; and not impossible that somewhat of the same nature may do good to *French-wines* also.

First, for *French-wines*, I think what I have in the beginning of this *discourse* declared, as the hint which first put me upon the conceit, that the over-fermenting of *Cider* was the cause that it lost of its original sweetness (*viz.* the making of three sorts of *Wine*, of one sort of *Grapes*) is a testimony that the first sort of *Wine* hath but little of the *gross Lee*, and consequently, *ferments* but little, nor loseth but little of the original sweetness; which makes it evident that the same thing will hold in *Wine*, which doth in *Cider*; but the great difficulty is (if I be rightly informed) that they use to let the *Wine* begin to *ferment* in the *Vat* before they put it into the *Hogsheads* or other *Vessels*; and thus they do, that the *Hucks* and other *Filth* (which in the way they use, must necessarily

cessarily be mingled with the *Wine*) may rise in a *scum* at the top, and so be taken off: Now if they please, as soon as it is *pressed*, to pass the *Wine* through a *strainer*, without expecting any such *purification*, and then use the same *Method* formerly prescribed for *Cider*, I do not doubt but the gross part of the *Lee* of *Wines*, being thus taken away, there will yet be enough left to give it a *fermentation* in the *bottles*, or second *vessel*, where it shall be left to stand, in case you have not *bottles* enough to put up all the *Wine* from which you have thus taken away the *gross Lee*.

This *Wine* I know not whether it will last so long as the other used in the ordinary way, or not; but this I confidently believe, it will not be so harsh as the same would have been if it had been used in the ordinary way; and the pleasantness of *Taste*, which is not unwholesome, is the chief thing which I prefer both in *Wine* and *Cider*.

Now for the *Hard-apple-Cider*, that it will receive an improvement by this way of ordering, hath been long my opinion; but this year an accident happened, which made it evident that I was not mistaken in this conjecture. For there was a *Gentleman* of *Heresfordshire*, this last *Autumn*, that by accident had not provided *Cask* enough for the *Cider* he had made; and having six or seven *Hogsheads* of *Cider* for which he had no *Cask*, he sent to *Worcester*, *Glocester*, and even to *Bristol*, to buy some, but all in vain; and when his *servants* returned, the *Cider* that wanted *Cask* had been some five days in the *Vat* uncovered; and the *Gentleman* being then dispatching a *Barque* for *London* with *Cider*, and having near hand a conveniency of getting *Glass-bottles*, resolved to put some of it into *bottles*; did so, and filled seven or eight *Hampers* with the clearest of this *Cider* in the *Vat*, which had then never wrought, nor been put into any other *Vessel* but the *Vat*; the *Barque* in which his *Cider* came had a tedious passage; that is, it was at least seven weeks before it came to *London*, and in that time most of his *Cider* in *Cask* had wrought so much that it was much harder than it would have been if it had according to the ordinary way lain still in the *Country*, in the place where it was first made and put up, and consequently, wrought but once.

But the other, which was in *Bottles*, and escaped the breaking, that is, by accident, had less of the *Lee* in it than other *bottles* had, or was not so hard stopped, but either before there was force enough from the *fermentation* to break the *bottle*, or that the *Cork* gave way a little, and so the *air* got out; or that the *Bottles* were not originally well *corked*, was excellent good, beyond any *Cider* that I had tasted out of *Heresfordshire*; so that from this *Experience* I dare confidently say, that the using *Hard-apple-cider* after the former *Method*, prescribed for *Pepin-cider*, will make it retain a considerable part of sweetness more than it can do after the *Method* used hitherto in *Heresfordshire*. Nor do I doubt but my *Method* will in a degree have the same effect in *Perry*, and the drink (as yet without a name that I do know of) which is made of the *juice* of *Wardens*, *Pears*, and *Apples*, by several persons, in several proportions;

portions; for the *Reason* being the same, I have no cause to doubt, but the effect will follow, as well in those *Drinks* as in *Cider* and *Wines*.

I am now come to my last *Affertion*; that *Cider* thus used cannot be unwholesome, but may be done to what degree any mans *Palate* desires.

First, It cannot be unwholesome, upon the same measure that stummed *Wine* is so; for that unwholesomeness is by leaving the cause of *fermentation* in the *Wine*, and not suffering it to produce its effect before the *Wine* be drank, and it ferments in mans body: and not only so, but sets other humours in the body into *fermentation*; and this prejudiceth their health that drink such *Wines*.

Now though *Cider* used in my *method* should not ferment at all, till it come into the *bottle*, and then but a little; yet the cause of *fermentation* being in a great degree taken away, the rest can do no considerable harm to those which drink it, being in it self but little, and having wrought in the *bottle* before men drink it; nor indeed do I think, nor ever find, that it did any inconvenience to my self, or any person that drank it when it was thus used.

Secondly, because the difference of mens palates and constitutions is very great; and that accordingly men like or dislike drink that hath more or less of the *fret* in it; and that the consequences in point of health are very different, in the *method* by me formerly prescribed: it is in your power to give the *Cider* just as much *fret* as you please, and no more; and that by several ways: for either you may *bottle* it sooner or later, as you please: or you may *bottle* it from two *Taps* in your *Vessel*, and that from the bigger *Tap* will have less *fret*, and the lower more: or you may *bottle* your *Cider* all from one *Tap*, and open some of the *bottles* about a week after for a few minutes, and then stop them up again; and that which was thus stop'd will have the less *fret*: or, if your *Cider* be bottled all from one *Tap*, if you will (even without opening the *bottles*) you may make some difference, though not so considerable as either of the former ways, by keeping part of the *bottles* warmer, for the first two Months, than the rest; for that which is kept warmest will have the most *fret*.

Sir PAUL NEILE's second Paper.

My Lord,

THE Paper which by the Command of the *Royal Society* delivered in the last year, concerning the ordering of *Cider*, I have by this years experience found defective in one particular, of which I think fit by this to give you notice, which is thus: Where-as in the former Paper I mention, that after the *Pepin-Cider* hath stood 24 hours in the *Vat*, it might be drawn off into Pails, and so put into the Vessel; and that having stood a second 24 hours in that Vessel, it might be drawn into another Vessel, in which it might stand till it were fit to *Bottle*; for the particulars of all which proceeding I refer to the former Paper; and shall now only mention, That this last year we were fain to draw it off into several Vessels, not only as is there directed, *twice*, but most of our *Cider* five, and some *six times*; and not only so, but we were after all this fain to *precipitate* the *Lee* by some of those ways mentioned by Dr. *Willis* in the 7th *Chap.* of his Treatise *De fermentatione*. Now though this be more of trouble than the Method by me formerly mention'd; yet it doth not in the least destroy that *Hypothesis* which in the former Discourse I laid down, (*viz.*) That it was the leaving too much of the *Lee* with the *Cider*, which upon the change of air, set it into a new *fermentation*, and consequently made it lose the sweetness; for this change by the indisposition of the *Lee* to settle this year more than others, hath not hindered the goodness of the *Cider*; but that when it was at last mastered, and the *Cider* bottled in a fit temper, it was never more pleasant and quick than this year: but I find that this year our *Cider* of Summer-Apples is already turned sowre, although it be now but the first of *January*; and the last year it kept very well till the beginning of *March*; which makes me fear that our *Pepin-Cider* will not keep till this time twelvemonth, as our *Pepin-Cider* of the last year doth till this day, and still retains its original pleasantness without the least turn towards sowreness.

And I am very confident, the difference of time and trouble, which this year we found in getting the *Cider* to *fine* and be in a condition to *Bottle*, was only the effect of a very bad and wet Summer, which made the Fruit not ripen kindly; and to make it yet worse, we had just at the time when we made our *Cider*, this year, extream wet and windy weather, which (added to the unkindliness of the Fruit) was the whole cause of this alteration: And however my *Hypothesis* as yet remains firm, for if by taking any part of the *Lee* from the *Cider* you can preserve it in its original sweetness, it is not at all material whether it be always to be done by twice drawing off from the *Lee*, or that it must sometimes

times be done with more trouble, and by oftner repeating the same Work, so that finally it be done, and by the same means, that is, by taking away part of the *Lee*, which otherwise would have caused too much *fermentation*; and consequently have made the *Cider* lose part of its original sweetness.

My Lord, I should not have presumed to have given you and the *Society* the trouble of perusing this Paper, but that, if possible, I would have you see, that what I think an error in any opinion that I have held, I am willing to own; and yet I desire not that you should think my mistake greater than in Reality it is.

OB.

OBSERVATIONS

Concerning the

Making, and Preserving

O F

CIDER:

B Y

JOHN NEWBURGH Esq;

I.

IF the *Apples* are made up immediately from the *Tree*, they are observ'd to yield *more*, but not so *good* Cider, as when *boarded* the space of a Month or six weeks; and if they contract any displeasing taste (as sometimes 'tis confest they do) it may be imputed to the Room they lie in, which if it hath any thing in it, of either too sweet or unfavoury smell, the *Apples* (as things most susceptible of impression) will be easily tainted thereby.

One of my acquaintance, when a child, boarding *Apples* in a Box where *Rose-Cakes* and other sweets were their companions, found them of so unfavoury taste, and of so rank a relish deriv'd from the too near neighbourhood of the Perfumes, that even a child's palate (which seldom mistakes any thing that looks like an *Apple*) could not dispense with it.

2.

It is therefore observ'd by prudent *Fruiterers*, to lay their *Apples* upon clean new made *Reed*, till they grind them for *Cider*, or otherwise make use of them. And if, notwithstanding this caution, they contract any rottenness before they come to the *Cider-press*, the damage will not be great, if care be had before the *Apples* be ground, to pick out the finnewed and the black-rotten; the rest, though somewhat of putrefaction hath pass'd upon them, will not render the *Cider* ill condition'd, either in respect of taste, or duration.

A

Concerning Cider.

A Friend of mine having made provision of *Apples* for *Cider*, whereof so great a part were found rotten when the time of grinding them came, that they did, as 'twere, wash the Room with their Juice, through which they were carried to the *Wring*, had *Cider* from them not only passable, but exceeding good; though not without previous use of the pre-mention'd Caution. I am also assured by a Neighbour of mine, That a Brother of his who is a great *Cider-Merchant* in *Devonshire*, is by frequent experience so well satisfied of the harmlessness of *Rotten-Apples*, that he makes no scruple of exchanging with any one that comes to his *Cider-press*, a Bushel of *sound-Apples* for the same measure of the other. Herein, I suppose, (if in other respects they be not prejudicial) he may be a gainer by the near compression of the tainted Fruit, which, as we speak in our Country Phrase, will go nearer together than the other. His advantage may be the greater, if the conceit which goes current with them be not a bottomless fancy, That a convenient quantity of *rotten-apples* mixt with the *sound*, is greatly assitant to the work of *fermentation*, and notably helps to clarify the *Cider*.

3.

It matters not much whether the *Cider* be forc'd to purge it self by working downwards in the Barrel, or upwards at the usual Vent, so there be matter sufficient left on the top for a thick skin or film, which will sometimes be drawn over it when it works, after the usual manner, as when 'tis presently stoppt up with space left for *fermentation*, to be perform'd altogether within the Vessel.

The thick skin, or *Leather-coat*, the *Cider* oftentimes contracts, as well after it hath purged it self after the usual manner, as otherwise, is held the surest preservation of its *spirits*, and the best security against other inconveniences incident to *this*, and other like *vinous* Liquors, of which the *Devonshire Cider-Merchants* are so sensible, that, beside the particular care they take, that matter be not wanting for the Contexture of this upper garment by stopping up the Vessel as soon as they have fill'd it; (with the allowance of a Gallon or two upon the score of *Fermentation*) they cast in Wheaten Bran, or Dust, to thicken the Coat, and render it more certainly Air-proof. And I think you will believe their care in this kind not impertinent, if you can believe a story which I have to tell of its marvellous efficacy: A near neighbour of mine assures me, that his Wife having this year fill'd a Barrel with *Mead*, being strong, it wrought so boisterously in the Vessel, that the good Woman casting her eye that way, accidentally, found it leaking at every chink, which ascribing to the strength of the Liquor, she thought immediately by giving it vent, to save both the Liquor and the Vessel, but in vain; both the Stopples being pulled out, the leakage still continued, and the Vessel not at all reliev'd, till casually at length putting

putting in her finger at the top, she brake the premention'd film; which done, a good part of the *Mead* immediately flying out, left the residue in peace, and the leakage ceased. It may seem incredible that so thin a skin should be more coercive to a mutinous Liquor, than a Barrel with Oaken-Ribs, and stubborn Hoops: But I am so well assur'd of the veritableness of my Neighbours Relation, that I dare not question it: The reason of it let wiser men determine.

4.

If the *Apples* be abortive, having been (as it usually happens) shaken down before the time by a violent Wind, it is observ'd to be so indispensably necessary that they lie together in hoard, at least till the usual time of their maturity, that the *Cider* otherwise is seldom, or never found worth the drinking.

A Neighbour told me, That making a quantity of *Cider* with *Wind-falls* which he let ripen in the Hoard, near a month interceding between the time of their decussion, and that which Nature intended for their maturity; his *Cider* prov'd very good, when all his Neighbours who made up their untimely fruit aloof as it fell, had a crude, austere, indigested Liquor, not worth the name of *Cider*.

5.

No Liquor is observ'd to be more easily affected with the favour of the *Vessel* it is put into, than *Cider*; therefore singular care is taken by discreet *Cider-Masters*, That the *Vessel* be not only *tasteless*, but also well prepar'd for the *Liquor* they intend to fill it with. If it be a new *Cask*, they prepare it by scalding it with Water, wherein a good quantity of *Apple-pomice* hath been boil'd: if a tainted *Cask*, they have divers ways of cleansing it. Some boil an *Ounce* of *Pepper* in so much Water as will fill an *Hogshead*, which they let stand in a *Vessel* of that capacity two or three days, and then wash it with a convenient quantity of fresh Water scalding hot, which they say is an undoubted cure for the most dangerously infected *Vessel*. A Friend and Neighbour of mine herewith cured a *Vessel* of so extreme ill favour, as it was thought it would little less than poison any *Liquor* that was put into it. Others have a more easie, and perhaps no less effectual Remedy. They take two or three stones of quick-Lime, which in six or seven Gallons of Water they set on work in the *Hogshead* being close stopp'd, and tumbling it up and down till the commotion cease, it doth the feat. Of *Vessels* that have been formerly used, next to that which hath been already acquainted with *Cider*, a *White Wine*, or *Vinegar Cask* is esteem'd the best; *Claret* or *Sack* not so good. A Barrel newly tenanted by small *Beer* suits better with *Cider* than a strong-*Beer* *Vessel*.

6. Half

6.

Half a peck of unground Wheat put to *Cider* that is harsh and eager, will renew its *fermentation*, and render it more mild and gentle. Sometimes it happens without the use of any such means to change with the season, and becomes of *sharp* and *sour* unexpectedly *benign* and *pleasant*. Two or three *Eggs* whole put into an *Hogshead* of *Cider* that is become sharp and near of kin to *Vinegar*, sometimes rarely lenifies and gentlizes it. One pound of *broad-figs* slit, is said to dulcifie an *Hogshead* of such *Cider*.

A Neighbour *Divine*, of my acquaintance, assured me, That coming into a *Parsonage-house* in *Devonshire*, where he found eleven *Hogshead* of *Cider*; being unwilling to sell what he never bought, he was three years in spending that store which the former *Incumbent* had left him; and it greatly amus'd him (as well it might, if he remember'd the old *Proverb*, *He mends as soon Ale in Summer*) to find the same *Cider*, which in *Winter* was almost as sharp as *Vinegar*, in the *Summer* become a potable and good natur'd *Liquor*.

7.

A little quantity of *Mustard* will clear an *Hogshead* of muddy *Cider*. The same *Virtue* is ascribed to two or three rotten *Apples* put into it. *Mustard* made with *Sack* preserves boil'd *Cider*, and spirits it egregiously.

8.

Cider is found to *ferment* much better in mild and moist, than in cold and dry weather. Every ones Experience hath taught him so much in the late frosty season. If it had not wrought before, it was in vain to expect its working or clearing then, unless by some of the artificial means premention'd, which also could not be made use of in a more inconvenient time.

9.

The latter running of the *Cider* bottled immediately from the *Wring*, is by some esteem'd a pure, clear, small, well relisht *Liquor*; but so much undervalued by them who desire strong drinks more than *wholesome*, that they will not suffer it to incorporate with the first running.

In *Devonshire* where their *Wring*s are so hugely great, that an *Hogshead* or two runs out commonly before the *Apples* suffer any considerable pressure, they value this before the other, much

E c e

after

after the rate which we set upon *Life-honey* (that which in like fort drops freely out of the *Combi*) above that which renders not it self without *compression*. In *Jersey* they value it a *Crown* upon an *Hogshead* dearer than the other: (This I take from the Relation of one of my Neighbours, who sometimes lived in that *Island*, which for *Apples* and *Cider* is one of the most famous of all belonging to his *Majesties* Dominions) Yet even upon *this*, and their choicest *Ciders*, they commonly bestow a pail of water to every *Hogshead*, being so far (it seems) of *Pindar's* mind, that they fear not any prejudice to their most excellent *Liquors* by a dash of that most excellent *Element*: Infomuch that it goes for a common saying amongst them, That if any *Cider* can be found in their *Island*, which can be prov'd to have no mixture of *Water*, 'tis clearly forfeited. It seems they are strongly conceited, that this addition of the most useful *Element*, doth greatly meliorate their *Cider*, both in respect of *Colour*, *Taste*, and *Clarity*.

I C.

The best *Cider-fruit* with us in this part of *Dorsetshire* (lying near *Bred-port*) next to *Pepin* and *Pearmain*, is a *Bitter-sweet*, or (as we vulgarly call them) *Bitter-scale*, of which for the first, the *Cider* unboil'd keeps well for one year; boiling it you may keep it two years or longer.

About seven years since I gave my self the Experience of *Bitter-scale-Cider* both crude and boil'd. I call'd them both to account at twelve Months end. I then found the *crude Cider* seemingly as good, if not better, than the *boiled*. But, having stopt up the *boil'd*, I took it to task again about ten Months after. At which time, I found it so excessively strong, that five persons would hardly venture upon an ordinary Glas full of it. My friends would hardly believe but I had heightned it with some of my *Chymical Spirits*. The truth is, I do not remember that I ever drunk any *Liquor*, on this side *Spirits*, so highly strong, and *spirituous*; but wanting pleasantness answerable to its strength, I was not very fond of my *Experiment*. In which I boil'd away, as I remember, more than half.

II.

A Neighbour having a good Provent of *pure-Lings* (an *Apple* of choice account with us) making up a good part of them to *Cider*, expected rare *Liquor*, but it prov'd very mean and pitiful *Cider*, as generally we find that to be, which is made without mixture. We have few *Apples* with us, beside the *Bitter-scale*, which yield good *Cider* alone; next to it is

is a *Deans-Apple*, and the *Pelesantine* I think may be mention'd in the third place; neither of which need the Addition of other *Apples* to set off the Relish, as do the rest of our choicest Fruits. *Pepins*, *Pearmains*, and *Gilliflowers* commixt, are said to make the best *Cider* in the world. In *Jersey* 'tis a general observation, as I hear, That the more of red any *Apple* hath in its rind, the more proper it is for this use. *Paleface's Apples* they exclude as much as may be from their *Cider-Vat*. 'Tis with us an observation, That no *sweet-Apple* that hath a tough rind, is bad for *Cider*.

12.

If you *boil* your *Cider*, special care is to be had; That you put it into the *furnace* immediately from the *Wring*; otherwise, if it be let stand in *Vats* or *Vessels* two or three days after the pressure, the best, and most *spirituous* part will ascend, and vapour away when the fire is put under it; and the longer the *boiling* continues, the less of goodness, or virtue will be left remaining in the *Cider*.

My *Distillations* sufficiently instruct me, That the same *Liquor* which (after *fermentation* hath pass'd upon it) yields a plentiful quantity of *spirit*, drawn off unfermented, yields nothing at all of *spirit*. And upon the same account it is undoubtedly certain, That *Cider* boil'd immediately from the *Wring*, hath its *spirits* compress'd, and drawn into a narrower compass, which are for the most part wash'd and evaporated by late unseasonable boiling.

CONCERNING

C I D E R,

By Doctor S M I T H.

THE best time to grind the Apples is immediately from the Tree, so soon as they are thoroughly ripe: for so they will yield the greater quantity of *Liquor*, the Cider will drink the better, and last longer than if the Apples were hoarded: For Cider made of hoarded Apples will always retain an unpleasing taste of the Apples, especially if they contract any rottenness.

The Cider that is ground in a *Stone-cask* is generally accused to taste unpleasingly of the *Rinds, Stems, and Kernels* of the Apples; which it will not if ground in a *Cask of Wood*, which doth not bruise them so much.

So soon as the Cider is made, put it into the *Vessel* (leaving it about the space of one *Gallon* empty) and presently stop it up very close: This way is observed to keep it longer, and to preserve its *spirits* better than the usual way of filling the *Vessel* quite full, and keeping it open till it hath done fermenting.

Cider put into a new *Vessel* will often taste of the *Wood*, if it be pierced early; but the same stopped up again, and reserved till the latter end of the year, will free it self of that taste.

If the Cider be sharp and thick, it will recover it self again: But if sharp and clear, it will not.

About *March* (or when the Cider begins to sparkle in the glass) before it be too fine, is the best time to bottle it.

Cider will be much longer in clearing in a mild and moist, than in a cold and dry *Winter*.

To every *Hogshead* of Cider, designed for two years keeping, it is requisite to add (about *March*, the first year) a quart of *Wheat* unground.

The best *Fruit* (with us in *Glocestershire*) for the first years Cider, are the *Red-strake*; the *White* and *Red Must-apple*, the sweet and four *Pepin*, and the *Harvey-apple*.

Pearmains alone make but a small liquor, and hardly clearing of it self; but, mixed either with sweet or four *Pepins*, it becomes very brisk and clear.

Must-apple-cider (though the first made) is always the last ripe; by reason that most of the *pulp* of the *Apple* passeth the *strainer* in pressing, and makes it exceeding thick.

The Cider of the *Bromsbury-crab*, and *Fox-whelp*, is not fit for drinking, till the second year, but then very good.

The Cider of the *Bromsbury-crab* yields a far greater proportion of *spirits*, in the distillation, than any of the others.

Crabs and *Pears* mixed make a very pleasing Liquor, and much sooner ripe than *Pears* alone.

OF

OF

C I D E R:

B Y

Capt. SYLLAS TAYLOR.

Herefordshire affords several sorts of Cider-apples, as the two sorts of *Red-strakes*, the *Gennet-moyle*, the *Summer-violet*, or *Fillet*, and the *Winter-fillet*; with many other sorts which are used only to make Cider. Of which some use each sort simply; and others mix many sorts together. This County is very well stored with other sorts of Apples; as *Pepins*, *Pearmains*, &c. of which there is much Cider made, but not to be compared to the Cider drawn from the Cider-apples; among which the *Red-strakes* bear the Bell; a *Fruit* in it self scarce edible; yet the juice being pressed out is immediately pleasant in taste, without any thing of that *restringency* which it had when incorporated with the *meat*, or *flesh* of the *Apple*. It is many times three Months before it comes to its clearness, and six Months before it comes to a ripeness fit for drinking; yet I have tasted of it three years old, very pleasant, though dangerously strong. The colour of it, when fine, is of a sparkling yellow, like *Canary*, of a good full body, and oily: The taste, like the Flavour or perfume of excellent *Peaches*, very grateful to the *Palate* and *Stomach*.

Gennet-moyles make a Cider of a smaller body than the former, yet very pleasant, and will last a year. It is a good eating pleasant sharp fruit, when ripe, and the best *Tart-apple* (as the *Red-strake* also) before its ripeness. The Tree grows with certain knotty extuberancies upon the branches and boughs; below which knot we cut off boughs the thickness of a mans wrist, and place the knot in the ground, which makes the root; and this is done to raise this fruit; but very rarely by grafting.

Of *Fillets* of both sorts (*viz.* Summer and Winter) I have made Cider of that proportionate taste and strength, that I have deceived several experienced *Palates*, with whom (simply) it hath passed for *White Wine*; and dashing it with *Red-Wine*, it hath passed for *Claret*; and mingled with the *Syrup* of *Raspberries* it makes an excellent *woman's wine*: The fruit is not so good as the *Gennet-moyle* to eat; The *Winter-fillet* makes a lasting Cider, and the *Summer-fillet* an early Cider, but both very strong; and the Apples mixt together make a good Cider.

These

These *Apples* yield a *liquor* more grateful to my *Palate* (and so esteemed of in *Herefordshire* by the greater *Ciderists*) than any made of *Pepins* and *Pearmains*, of which sorts we have very good in that *Country*; and those also both *Summer* and *Winter* of both sorts, and of which I have drank the *Cider*; but prefer the other.

Grounds separated only with a *Hedge* and *Ditch*, by reason of the difference of *Soils* have given a great alteration to the *Cider*, notwithstanding the *Trees* have been grafted with equal care, the same *Grafts*, and lastly the same care taken in the making of the *Cider*. This as to the *Red-strake*; I have not observ'd the same *nice*ness in any other fruit; for *Gennet-moyles*, and *Filletts* thrive very well over all *Herefordshire*. The *Red-strake* delights most in a fat soil: *Hamlacy* is a rich intermixt soil of *Red-fat-clay* and *Sand*; and *Kings-capel* a low hot sandy ground, both well defended from noxious *Winds*, and both very famous for the *Red-strake-cider*.

There is a *Pear* in *Hereford* and *Worcester-shires*, which is called *Bareland-pear*, which makes a very good *Cider*. I call it *Cider* (and not *Perry* because it hath all the properties of *Cider*. I have drank of it from half a year old to two years old. It keeps it self without *Roping* (to which *Perry* is generally inclined) and from its taste: Dr. *Beal*, in his little *Treatise* called the *Herefordshire-Orchard*, calls it deservedly a *Masculine Drink*; because in taste not like the sweet insidious feminine juice of *Pears*. This *Tree* thrives very well in barren ground, and is a fruit (with the *Red-strake*) of which *swine* will not eat; therefore fittest to be planted in *Hedge-rows*.

Red-strakes and other *Cider-apples* when ripe (which you may know partly by the blackness of the *Kernels*, and partly by the colour and smell of the fruit) ought to be gathered in *Baskets* or *Bags*, preserved from bruising, and laid up in heaps in the *Orchard* to sweat; covered every night from the dew: Or else, in a *Barn-floor* (or the like) with some *Wheat* or *Rye-straw* under them, being kept so long till you find, by their mellowing, they are fit for the *Mill*.

They that grind, or bruise their *Apples* presently upon their gathering, receive so much *liquor* from them, that between twenty or twenty two *Bushels* will make a *Hogshead* of *Cider*: but this *Cider* will neither keep so well, nor drink with such a fragrance as is desired and endeavoured.

They that keep them a month or six weeks hoarded, allow about thirty *bushels* to the making of a *Hogshead*; but this hath also an inconvenience; in that the *Cider* becomes not fine, or fit for drinking, so conveniently as a mean betwixt these two will afford.

Keep them then about a fort-night in a board, and order them to be of such a cast by this mellowing, that about twenty five *Bushels* may make a *Hogshead*, after which mellowing proceed thus.

1. Pick

1. Pick and clear your *Apples* from their stalks, leaves, moaziness, or any thing that tends toward rottenness or decay.

2. Lay them before the stone in the *Cider-Mill*, or else beat them small with *Beaters* (such as *Paviors* use to fix their pitching) in deep troughs of *Wood* or *Stone* till they are fit for the *Press*.

3. Having laid clean wheat straw in the bottom of your *Press*, lay a heap of bruised *Apples* upon it, and so with small handfuls or wisps of straw, which by twisting takes along with it the ends of the straw laid first in the bottom, proceed with the bruised *Apples*, and follow the heaps with your twisted straw, till it comes to the height of two foot, or two foot and a half; and so with some straw drawn in by twisting, and turned over the top of it (so that the bruised *Apples* are set as it were into a deep Cheef-vat of straw, from which the *Country* people call it their *Cider-cheefe*) let the board fall upon it even and flat, and so engage the force of your skrew or *Press* so long as any *Liquor* will run from it. Instead of this *Cheefe* others use bags of *Hair-cloth*.

4. Take this *Liquor* thus forced by the *Press*, and strain it thorow a strainer of hair into a *Vat*, from whence straight (or that day) in pails carry it to the *Cellar*, turning it up presently in such *Vessels* as you intend to preserve it in; for I cannot approve of a long evaporation of spirits, and then a disturbance after it settles.

5. Let your *Vessels* be very tight and clean wherein you put your *Cider* to settle: The best form is the *stun* or *stand*, which is set upon the lesser end, from the top tapering downwards; as suppose the head to be thirty inches diameter, let then the bottom be but eighteen or twenty inches in diameter; let the Tun-hole or Bung-hole be on the one side outwards, towards the top. The reason of the goodness of this form of *Vessel* is, because *Cider* (as all strong *Liquors*) after fermentation and working, contracts a cream or skin on the top of them, which in this form of *Vessel* is as it sinks contracted, and fortified by that contraction, and will draw fresh to the last drop; whereas in our ordinary *Vessels*, when drawn out about the half or middle, this skin dilates and breaks, and without a quick draught decays and dies.

6. Reserve a *Pottle* or *Gallon* of the *Liquor* to fill up the *Vessel* to the brim of the *Bung-hole*, as oft as the fermentation and working lessens the *Liquor*, till it hath done its work.

7. When it hath compleated its work, and that the *Vessel* is filled up to the bung-hole, stop it up close with well mix'd clay, and well tempered, with a handful of Bay-salt laid upon the top of the clay, to keep it moist, and renewed as oft as need shall require; for if the clay grows dry it gives vent to the spirits of the *Liquor*, by which it suffers decay.

I am



I am againſt either the *boyling* of *Cider*, or the hanging of a bag of *ſpices* in it, or the uſe of *Ginger* in drinking it; by which things people labour to correct that *windineſs* which they fancy to be in it: I think *Cider* not *windy*; thoſe that uſe to drink it are moſt free from *windineſs*; perhaps the *virtue* of it is ſuch, as that once ripened and mellowed, the drinking of it in ſuch ſtrength combats with that *wind* which lies inſenſibly latent in the body. The *Cider* made and fold here in *London* in *Bottles* may have that *windineſs* with it as *Bottle-beer* hath, becauſe they were never ſuffered to *ferment*: But thoſe that have remarked the ſtrength and vigour of its *fermentation*, what weighty things it will caſt up from the bottom to the top, and with how many bubbles and bladders of *wind* it doth *work*, will believe that it clears it ſelf by that operation of all ſuch injurious *qualities*.

To preſerve *Cider* in *Bottles* I recommend unto you my own *Experience*, which is, Not to *bottle* it up before *fermentation*; for that incorporates the *windy quality*, which otherwiſe would be ejected by that operation: This violent ſuppreſſion of fermentation makes it *windy* in drinking, (though I confeſs *brisk* to the *taſte*, and *ſprightly* cutting to the *Palate*.) But after *fermentation*, the *Cider* reſting two, three, or four Months, draw it, and *bottle* it up, and ſo lay it in a *Repoſitory* of cool *ſpringing water*, two or three foot, or more, deep; this keeps the *ſpirits*, and the beſt of the *ſpirits* of it together: This makes it drink quick and lively; it comes into the *glaſs* not *pale* or troubled, but bright *yellow*, with a ſpeedy vaniſhing *nittineſs*, (as the *Vintners* call it) which *evaporates* with a *ſparkling* and *whizzing* noiſe; And than this I never taſted either *Wine* or *Cider* that pleaſed better: Inſomuch that a *Noble-man* taſting of a *Bottle* out of the *water* (himſelf a great *Cideriſt*) proteſted the excellency of it, and made with much greater charges, at his own dwelling, a *water Repoſitory* for his *Cider*, with good ſuccels.

An

An ACCOUNT of

Perry and Cider

Out of GLOUCESTER-SHIRE,

Imparted by

DANIEL COLLWALLEſq;

ABOUT *Taynton* Five Miles beyond *Glouceſter*, is a mixt ſort of *land*, partly *Clay*, a *Marle*, and *Craſh*, as they call it there, on all which ſorts of *land*, there is much *Fruit* growing, both for the *Table* and for *Cider*: But it is *Pears* it moſt abounds in, of which the beſt ſort is that they name the *Squaſh-Pear*, which makes the beſt *Perry* in thoſe Parts. Theſe *Trees* grow to be very large, and exceeding fruitful, bearing a fair round *Pear*, red on the one ſide, and yellow on the other, when fully ripe: It oftentimes falls from the *Tree*, which commonly breaks it; but it is of a nature ſo *harſh*, that the *Hogs* will hardly eat them.

They uſually plant the *ſtocks* firſt, and when of competent bigneſs (and tall enough to prevent *Cattel*) graff upon them: 'Tis obſerved, that where *land* is *Flow'd* and dreſ'd for *Corn*, the *Trees* thrive much better than in the *Pature-grounds*, ſo as divers *Orchards* are yearly *plow'd* and ſown with *Corn*, which for the moſt part, they ſuffer their *Swine* to eat upon the ground, without cutting; and ſuch *Plantations* ſeldom or never fail of plentiful *Crops*, eſpecially in the *Rye-land*, or light *Grounds*.

About *Michaelmas* is made the beſt *Cider*, and that of ſuch *Fruit* as drops from the *Trees*, being perfectly mature; and if any are gathered ſooner, they let them lie in the *houſe* 8 or 9 days for the better mellowing.

The beſt *Mills* to grind in, are thoſe of *Stone*, which reſembles a *Mill-ſtone* ſet *edge-ways*, moved round the *Trough* by an *Horſe* till the *Fruit* be bruited ſmall enough for the *Preſs*: This done, then put it up into a *Crib* made with ſtrong ſtudds, and *Oaken* or *Hazel* twigs about 3 foot high, and 2½ wide, which is placed on a *Stone* or *Wooden Cheeſe-fat*, a foot broader than the *Crib*, fitted to a round *Trough* for the *Liquor* to paſs into the *Ciſtern* which is a large Veſſel: When the *Crib* is filled with the bruited ground *Fruit*, they put a *Stone* upon it, but firſt they ſet a *Circle* of freſh *ſtraw* about the *Crib*, to preſerve the *Muſt* (which is the bruited *Fruit*) from ſtraining through the *Crib* when they apply the *ſkrews*, which being two in number, and of a good

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good size, turn in a great *beam*, and so are wrung down upon the *Crib*, within which they place two wide and thick *Cheese-fats*, and several *blocks* upon the *Fruit*, to crush it down with the more force, by which means it is wrung so *dry*, as nothing can be had more out of it. A *Crib* will contain at *once*, as much ground *Fruit*, as will make above an *Hogshead* of *Cider*, and there may be dispatched *six* or *seven* such *Vessels* in one day.

When the *Pressing* is finished, they take out the *Fruit*, and put it into a great *Fat*, pouring several *Pails* of *Water* to it, which being well *impregn'd*, is ground again slightly in the *Mill*, to make an ordinary *Cider* for the *servants*; this they usually drink all the *Year* about.

When the best *Liquor* is tun'd up, they commonly leave the *Bung-hole* open, for *nine* or *ten* days, to *ferment* and *purify*; for though in most places they add *straining* to all this, yet some of the *Husks* and *Ordure* will remain in it. The *Vessel* after a day or two standing, is fill'd up, and still as the *Cider* waxes in working, they supply it again, till no more *filth* rises; and then *stop* it up very accurately close, leaving only a small *breathing* hole to give it air for a *Month* after, and to prevent the *bursting* of the *Vessel*.

Note, That they sometimes put $\frac{1}{2}$ *Pears*, and $\frac{1}{4}$ of *Apples*.

The usual Names of Gloucester-shire Cider-Fruit.

Red-straker, growing chiefly in the *Rye-Lands*, sweet *White-Musts*, *Red-Musts*, the *Winter-Must*, the *Streak-Must*, the *Gennet-Moyle*, the *Woodcock-Apple*, the *Broms-grove-Crab*, the *Great-white-Crab*, the *Heming*, and divers other sorts, but these are the principal.

The *Pears* for *Perry* are,

The *Red Squash-pear* esteem'd the best, the *John-pear*, the *Har-pary Green-pear*, the *Drake-pear*, the *Green Squash-pear*, the *Mary-pear*, the *Lullam-pear*: these are the chief.

For

For making of Cider out of Mr. Cook.

LET your *Fruit* hang till thorow *Ripe*, to be known by the brownness of the *Kernel*, or that they rattle in the *Apple*, or if they fall much in still weather, or that they handle like dry wood, founding if tossed up: If it be green, your *Cider* will be *sowre*. Gather dry, with these directions, reject the much *bruised*, they will rot, marr the *taste*, and give an high *Colour*.

Of good yielding *Fruit* not too long kept, 18 or 20 *Bushels* will make an *Hogshead*: If you gather not by hand, which is tedious, lay a truss of *Straw* beneath the *Tree* and over that a *Blanket*, discreetly shaking it down, not too many at a time, but often carrying them where they are to sweat, which should be on dry *Boarded* floors, by no means on *Earth*, unless store of sweet *Straw* lie under: By about 10 or 14 days they will have done sweating: Then *Grind* or *Beat* them, keeping the *Fruit* several in case you have enough to fill a *Vessel* of one kind, if not, put such together as are near ripe together, for its more uniformly *fermenting*. Winter *Fruit* may lie 3 weeks or a month ere you *grind*; the greener they are when gathered, let them lie the longer.

Being *Ground* let them continue 24 hours before *pressing*, 'twill give it the more *Amber* bright colour, hinder its over *Fermenting*; and if the *Fruit* were very mellow, add to each 20 *Bushels* of stampings, 6 *Gallons* of pure water, poured on them so soon as beaten: The softer and *mellower*, the more *water* to restrain its over-working, and though the *Cider* be weaker, it will prove the pleasanter: for over ripe and *mellow* *Fruit*, let go so much of the loose and fleshy substance through the percolation, that with difficulty will you separate the *Lee* from the *Liquor* before it *Ferment*, and then away go the brisk and pleasant *Spirits*, and leave a vapid or *sowr* drink contracted from the remanent gross *Lees*: The *Cider* made of such *Fruit* had need be settling 24 hours in a large *Vat* or *Vessel*, that the *Faces* may settle before you tun it up, and then draw it off, leaving as much of this thick *Lee* behind as you can; (which yet you may put among your pressings for a water *Cider*.) If you conceive your *Cider* still so turbid that it will work much, then draw it into another *Vessel* by a *Tap*, 2 or 3 inches from the bottom, and so let it settle so long as you think it is near ready to work in it: for if it work in your *Tubs*, little of the gross *Lees* will you be able to get from it: *Note*, that you must keep it cover'd all the time it is in your *Tubs*, and the finer you put it up in your *Vessel*, the less it will *Ferment*, and the better your drink: But in case you chill the *Cider* (as oft it happens in cold winter weather) so as it do not work when put into *Cask*, cast into it a *pin* of the juice of *Alehoof* with half the quantity of *Icing-glass* to refine it, which though it do not suddenly, at the *spring* it will.

These directions observ'd Barrel it up, and when it ceases working,

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ing, bung it close, and reserve it so till fit to bottle, that is when fine, since till then it will endanger their bursting, and if you would have it very brisk and cutting (which most affect) put a little lump of Loaf-sugar into every Bottle.

The Golden Pepin, Kerton Pepin, Russet Harvy, Kentish Codling make excellent Cider; but above all Red-strakes, and Gennet-moys. Indeed any Apple which is not a Crab, there being divers sorts of Wildings and hard-flesh'd Apples proper for this liquor: But that Pear or Apple which is of a soft and loose flesh is not fit to make a Vinous drink, because of their breaking into so many particles, which are so difficult to separate: That Fruit therefore which being press'd, flats down and separates least, and that being kept beyond its time of maturity, grows rather tough than mellow, is far the best.

For Water-cider, take your stampings when you press them from your first liquor, and put them into Tubs, and they being full put to them half as much water as you had of Cider, the riper your Fruit, the more water; cover your Vessels and so let them stand four or five nights and days, if the season be cold, a full week; then press the stampings, as having as much as will fill a Vessel, set it on the Fire and scum it well, and that abated somewhat, pour it into Coolers, and being cold, tun it up, and bung it well after it has left working; In a Month after you may drink. Some add a little Ginger, Cloves, Juniper-berries, as they fancy.

In this sort order Perrys, only let not the Fruit be too ripe: Those of hard flesh, stonyest core and harsh taste are best: He recommends a Pear near Watford: and Capt. Wingats near Welling, also Ruskin pear.

Most sort of baking-Pears make good Perry.

Be curious of sweet well season'd Casks, such as have had Sack, White, Claret or good Ale in them before.

Another.

TAKE your Apples when they relish best, not too green, nor too mellow, they who have large Plantations may shake their Trees a little, and gather those which fall off easily, and press them the same day: Fill not your Cask above three quarters full, and let it stand till it grow clear, which is commonly within eight or ten days, and then draw off only the clear, and fill up a clean Cask almost to the top; giving it vent thrice a day, lest it burst the vessel, and so continue to do for a week.

Then, for every ten Gallons of Cider, take one pound of Raisins of the Sun, and put them into some Brandy for a day or two, and then take only the Raisins and fling them into the Cider letting it stand three or four days more; lastly, stop the Cask very close, but Bottle it not till March, except it be of Codlings, which will not keep so long.

Another.

Another.

Cider of Harvy-Apples, or Pepins boyld sent me out of Wales by Sir Thomas Hanmer.

YOU must take only one sort of those Apples without mixture of kinds, and when they are stamp'd, let them be strain'd, boiling the juice, and continually as the scum rises, clear it: In this work you must diligently watch and observe the colour as it boils, and not suffer it to exceed the looks of good small-Beer, for if you expect till it be too high charg'd, it will become nothing worth: The Cider well clear'd of the scum, so soon as it is cold tunn it into a sweet Vessel leaving only a vent, the rest close stop'd, and when it fings, and begins to bubble up at the vent, draw it out into Bottles carefully clos'd: This will become excellent drink. Note, that you are to stamp and make your Cider of Harvy Apples as soon as they are gather'd; but the Pepins may lie at the least six weeks without detriment.

Another Account of CIDER from a Person of great Experience.

Cider-Apples for strength, and a long lasting Drink, is best made of the Fox-Whelp of the Forest of Dean, but which comes not to be drunk till two or three years old.

2. Bromsborrow-Crab the second year; In the Coast and Traff 'twixt Hereford and Ledbury.

3. Under-leaf, best at two years, a very plentiful bearer, hath a Rhenish-wine flavour; the very best of all Ciders of this kind, boarded a little within doors. The longer you would keep, the longer you must board your Fruit.

4. The Red-strake of Kings-Capel, and those parts, is in great variety: Some make Cider that is not of continuance, yet pleasant and good; others, that lasts long, inclining towards the Bromsborrow Crab rather than a Red-strake.

5. A long pale Apple, called the Coleing, about Ludlow, an extraordinary bearer.

6. The Arier-Apple, a constant bearer, making a strong and lasting Cider; some call them Richards, some Grang-apples; and indeed they make so excellent a Drink, that they are worthy to be recover'd into use.

7. The Olive, well known about Ludlow, may, I conceive, be accounted of the Winter-Cider-Apples, of which 'tis the constant report, that an Hogshead of the Fruit will yield an Hogshead of Cider.

The

The Summer-Ciders are,

1. The *Gennet-Moyl* of one year : The best *Baking-Apple* that grows, and keeps long *baked* ; but not so *unbaked* without growing *mealy* : it *drys* well in the *Oven*, and with little trouble. The *Gennet-Moyl-Cider*, when the *Fruit* is well *boarded* and mellow, will body, and keep better.

2. The Summer *Red-frake*, of a wonderful *fragrant* and *Aromatic* quality.

3. Sir Ed. Harley's little *Apple*, esteemed to make one of the richest *Ciders* in the World. Also, his,

4. Great Summer-*Apple*, resembling the *Red-frake*, juicy and *Aromatic*.

5. The *White-Must*, *streaked-Must*, &c. great bearers, and their *Cider* early ripe.

6. *Pearmains*, have made excellent *Cider*, as good, if not superior to any other in some years ; and though it be true, that every sort of *Fruit* makes better *Drink* some years than others ; yet, for the most part, the goodness and perfection of *Cider* results from the lucky, or intelligent *Gathering*, or *Hoarding* of the *Fruit*, or from both ; and this *knowledge* must be from *Experience*.

7. Generally, the *Cider* longest in *fining*, is strongest and best lasting, especially if the *fruit* have been well *boarded* for some time.

8. *Cider* made of *Green*, and immature *Fruit*, will not *fine* kindly, and when it does, it abides not long good, but suddenly becomes *eagre*.

9. *Cider* kept in very cool *Cellars*, if made of ripe *Fruit*, renders it long in *fining*, and sometimes *Cider* by exposing abroad in the *sun*, and kept *Warm*, hath sooner *matur'd*, and continu'd long good : But the best *Drink* is that which *finest* of it self, preserved in an indifferent temper.

10. All *Cider* suffers *Fermentation* when Trees are *blossoming*, though it be never so old ; and *Cider* of very ripe *Fruit*, if *Bottl'd* in that *season*, will acquire a *fragrancy* of the *Blossom*.

11. New *Cider*, and all diluted and watred *Ciders*, are great *Enemies* to the *Teeth*, and cause violent *pains* in them, and *Rheums* in the *Head*.

12. One *Rotten-Apple*, of the same kind with the *sound*, corrupts a whole *Vessel*, and makes it *Musty*.

But since the *second*, and former *Impressions* of these *Discourses*, there is publish'd (by an ingenious and obliging hand) the *Vine-um Britannicum*, treating not only of *Cider*, but such other *Wines*, and *Drinks*, as are extracted out of several *Fruits* : It is *there* he recommends,

The not gathering *Fruit* for *Cider*, till full maturity and *fragrancy* ; and that it is better to make several *Pressings*, than all at once, proportioning the *Vessels* accordingly.

That the *Fruit* be carefully gather'd, not *windfall'n* nor *bruis'd* :
let

let such be left to dry a competent time before *grinding*, suffering your *Cider* thoroughly to *ferment* before you *Cask* it up.

Let *Cider* fruit remain some time in the *heap* upon dry *straw*, and under shelter, in a sweet place, to *sweat* out the *phlegm* and superfluous moisture, from ten to twenty days, if the *Fruit* be *harsh*, but not too long.

Then extract the *Liquor*, either by *hand-pounding* with great *Pestles* (which is the ruder and worst way) or by the *Horse-Mill*, with the *Mill stone* on edge in a *Trough of stone*, *Expeditions* but chargeable : Or by *grating*, *beating* with a *Maule*, which are trifling : or, *best of all*, by an *Engine* describ'd by the *Author* p. 82, &c. to which we refer the curious.

Remember, when you bring your *Fruit* to the *Mill*, you reject the *rotten*, *unripe*, *stalks*, and *leaves*.

That you grind not so small, as that too much of the *Pulp* pass with the *liquor*.

That after *grinding* it stand 24 or 48 *hours*, both to acquire *colour*, and that the unbruised parts of the *Fruit*, may the easier separate from the juice in the *Press*.

That some of the *Cider* be suffer'd to distill either through a false bottom to the *Vat*, or by a *Tap*, into a fit *Recipient* ; This being the *Virgin*, and best *liquor*. Lastly,

That you squeeze the bruised *Pulp* in the *skew-Press*, within a *circle* of clean, sweet *Wheat-straw* ; winding in the *heap* with the *wisp* to a foot in height, before you place the *board*, and apply the *straw*. But instead of the *straw-wisp*, a *Basket* may be fitted, which with a little *straw* within will keep the *Fruit* in better order : some make use of a *Hair-cloth-bag* placed in a frame.

That you *press* it as dry as may be, unless you intend to make a *diluter* sort, by mixing therewith the *Mure*.

That you pour the *Liquor* coming from the *Press*, through a *strainer* into a large *Vat*, to detain the grosser pieces of the *Fruit* from intermixing with the *clear*.

That you do not turn it up immediately, as some pretend to prevent *evaporation* of *Spirits* ; but, to cast a *cloth*, or *Blanquet* over the *Vat*, to the end that the wild, and untameable *Spirits* (which would even burst the *Barrel*) may be a little chequ'd and subdu'd.

That you carefully separate the *Flying Lee*, namely, the dispers'd, and grosser *Particles* of the *Fruit*, which comes with the *liquor* ; This facilitated by *warmth*, or *Ising-glass*, three or four *ounces* to an *Hogshead*, beaten thin, *macerated*, and cut in small pieces in *White-wine* ; then set on a gentle *Fire*, till 'tis well dissolv'd, boil it in a *Gallon* of *Cider*, and cast it into the *Mash*, suppose it of 20 *Gallons*, and so to every like proportion, stirring it well, and covering it close, for ten or twelve *hours*, within which time, it will usually have *precipitated* the *Glass* : Thus, when it ceases working, draw it from the *scum* with a little *Spigot* below, or better, by a *Syphon* above, and so *barrel* it up close.

Note, that as you augment the proportion of *Ising-glass*, or *Water-*
ter-

ter-glew, so it will become more *limpid* and clear; but there is a mediocrity to be observ'd, lest you render it too lean and thin.

That this way, as 'tis useful to the *defecating* of the *juices*, of all other *Liquors* made of *Fruit*; so is it preferable to all *Fermentations* of *Teft*, *Toasts*, *Percolations*, and *Rackings*, which not only tend to *Acidity*, but waste, and dispirits the *juices*, and besides is very troublesome.

The residence of impure *Faces* may be cast on the *Mure*, if you repress for a *Water-Cider*.

That *Liquors* thus purified are not obnoxious (by so frequent *refermentations*) to burst the *Bottles* upon change of weather.

Lastly, is prescribed the same form of standing *Vessels*, to preserve and keep it in, as we have already mention'd. The *Bung-hole* to be of two inches *diameter* with a *Plug*, and a *Vent-hole* near it.

That new *Vessels* be season'd, and scalded with *Water* in which *Apple-pumis* hath been boiled: If old *Vessels*, that they be such as have been us'd for *Canary*, *Spanish-wines*, or *Atheletin*, by no means *Ale* or *Beer*, yet *small beer* vessels if well scalded, may serve upon occasion.

To correct the *mustiness* of *Vessels* is prescribed a decoction of *Pepper* in water, one *ounce* to a *Hogshead*; the *Vessel* being fill'd with it scalding hot, and so let stand two or three days: The same is *cur'd* with two, or three *stones* of *quick lime*, to fix or seven *Gallons* of water; put into the *Hogshead* close stop'd, and roll'd up and down.

Glass bottles preferred; the *stopples* exquisitely fitted by grinding them with *oyl* and *Smyris*, or *Emery* (as our workmen call it) being careful to preserve each *stopple* to its *Bottle*, by tying it by the *knob*, to the neck thereof with a packthread.

The *Cure* of *musty Bottles* is boyling them in a vessel of water, putting them in whilst the water is *cold* to prevent their *Cracking*, and then set them on *straw*, and not on the cold floor, when you take them out.

In *Tunning* your *Cider*, the *Vessels* dry, fill them within an *inch* or less of the top, that there be space for the *head* or *skin*: Remembring to leave the *Bung-hole* open, or slightly cover'd two, or three days, to perfect its *fermenting*, if it happen to work: If not, and that it be design'd for long keeping, put into it some unground *Wheat*, a *quart* to an *Hogshead*, which inducing an artificial *head* or *skin*, protects it from all possible injury of the *Air*.

Having clos'd the *Bung*, peg the *Vent* but loosely; that in case the liquor be unquiet, it may not heave up the head of the *Barrel*: wherefore you must stop, and ease the *Vent* from time to time discreetly, till all be in repose.

It is good to cover the *Plug* exactly adjusted to the *Bung* with a brown paper wetted, the better to wring it close.

Cider thoroughly purified, may be *bottl'd* at any time or season: If early, and vigorous it will need no assistance; if *later*, *flat*, or *acid*, spirit it with a little *loaf Sugar*: If you *bottle* it *early* (to prevent

prevent any remanent *fermentation*) let them stand a while before you stop them close; or be sure to open them within two or three days after.

If you stop with *Corks*, let them be sweet, boyl'd, and us'd whilst yet moist, laying the *Bottles* side-ways. Note, that they stand better on the *ground*, than in *Frames*, unless in vaulted *Cellar*s: But a *Refrigeratory* with a cold *Spring*, especially if it be running water, is most excellent. Note, that the binding down of the *Cork* indangers the *Bottles* breaking, whereas that omitted, you hazard only loss of the *Liquor*.

Cider boyl'd with *spices* not approv'd (though pleasant) as apt to contract an unsavory tincture from the *Vessel* 'tis boyl'd in: But this may *happily* be reform'd by such as are *tinn'd*.

Cider boyl'd to the expence of half, will keep well, and is very strong.

To restore decay'd *Liquor*; if flat, and *vappid* from a too free admission of *Air*, or ill stopping; Grind a parcel of *Apples*, putting them in by the *Bung-hole*; then stop the *Vessel* close, and sometimes give it *vent*: But this must be drawn off in few days, lest the *Mure* vitiate the *whole*: This yet may be prevented, by putting up only the new *Must* of the *Fruit* you press, on the decay'd *Cider*: The same may be done in *Bottles*, by adding a *spoonfull* or two of such *Must*, and stopping them carefully.

Acid Cider will sometimes recover of it self, in case any *Lee* remain; if not, add a *Gallon* of unground *Wheat* to each *hogshead*; or *Bottle* it with *Sugar*.

Cider turn'd and eager, is irrecoverable.

Musty Cider is best corrected, seldom restor'd with *Mustard-seed*, ground with some of the *Liquor*. Thick *Cider* is *cur'd* by exciting new *fermentation*.

To *Tun* it in *Vessels* fum'd with *Sulphur*, is an excellent, and wholesome preservative of *Cider*. See p. 117.

Water Cider.

Boil'd water, suffer'd to stand (till cool'd) is best, as being more *defecated*, and that it be mix'd in the *grinding*: This small *Beveredge* or *Ciderkin* and *Pure* (as 'tis call'd) is made for the common drinking of *Servants*, &c. supplying the place of small *beer*, and to many more agreeable: It is made by putting the *Mure* into a large *Vat*, adding what quantity of water you please, namely, about half the quantity of the press'd *Cider*, or more, as you desire it *stronger* or *smaller*: Note, that the water should stand 48 *hours* on it, before you press, *Tunning* up and immediately stopping what comes from the *Press*: Thus it will be *drinkable* in few days, clarifying it self: 'Tis fortified, by adding to it the *Lee* or setting of better *Cider*; putting it on the *Pulp* before *pressure*, or by some superfluous *Cider*, which your *Vessels* could not contain, or by *grinding* some *fall'n* and refuse *Apples*.

Ciderkin will be made to keep long by being *boil'd* after *pressure*

G g

Concerning Cider.

sure with such a proportion of *Hops*, as is usually added to *Beer*; in which case you need not to boil the *Water* before.

Mixtures.

Though *Cider* needs not any, 'tis yet a very proper *vehicle* to transfer the virtue of any *Aromatic*, or *Medicinal* thing: such as *Ginger*, *Juniper*, &c. the *Berries* dried six, or eight in each *Bottle*, or proportionably in the *Cask*; But this is not so palatable as *wholesome*.

Ginger renders it brisk: dried *Rosemary*, *Wormwood*, juice of *Coriints*, &c. whereof a few drops tinges, and adds a pleasant quickness. Juice of *Mulberries*, *Blackberries*, and (preferable to all) *Elderberries* press'd among the *Apples*, or the *Juice* added: *Clove-July-flowers* dry'd, and macerated both for *tincture* and *flavor* is an excellent *Cordial*: Thus may the *Virtues* of any other be extracted: Some stamp *Malago Raisins*, putting *Milk* to them, and letting it percolate through an *Hippocras* sieve: A small quantity of *this*, with a *spoonful* or two of *Syrup of Clove-July-flowers* to each *Bottle*, makes an incomparable drink.

Perry.

Let not your *Pears* be over mellow when you grind them, the *pulpiness* obstructing the juice.

Crabs mix'd in grinding, improve the *Perry*, discretely proportion'd, according to the sweetness of the *Pear*: That of *Bosbury* yields the most lasting liquor.

Vinegar of Cider

Is made by putting it upon the *Rape*, as the *French* to their bad *Wines*: by *Rape* is meant, the *Husks* of the *Grape* close press'd, which our *Vinegarists* have out of *France*, and use it as a *Leaven* to give it that *Acidity*: The *Husks* of our *English* grape will probably supply the want of the other, not so easily to be had.

Virtues.

Innumerable are the *Virtues* of *Cider*, as of *Apples* alone, which being raw eaten, relax the *Belly*, especially the *sweet*, aid *concoction*, depress *vapours*; being roasted or cooked are excellent in *hot* distempers, resist *Melancholy*, *Spleen*, *Pleurisfe*, *Strangurie*, and being sweetened with *sugar*, abate inveterate *Colds*: These are the common effects even of raw *Apples*; but *Cider* performs it all, and much more, as more active and pure; in a word, we pronounce it for the most *wholesome Drink* of *Europe*, as *specifically* sovereign against the *Scorbut*, the *Stone*, *Spleen*, and what not?

Pears are nourishing, especially the baked *Warden*, adulcorated with *sugar*, and is exceedingly restorative in *Consumptions*; the *Perry* a great *Cordial*, &c.

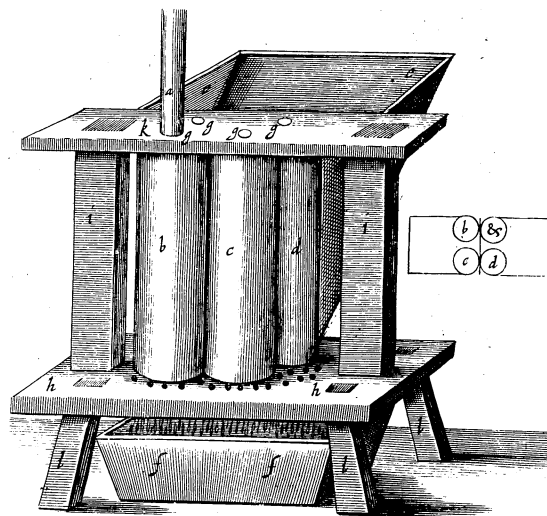
After

Concerning Cider.

After this our *Author* passes to an *Enumeration* of the best *Apples* and *Pears*, which we pass by; because the *curious* will find them at the end of the annex't *Kalendar*; Nor should I have subjoin'd what we have here accumulated concerning *Cider*, occurring (as most of it does) in the former *Papers*, especially those of *Dr. Beale*, and *Esq; Newburgh*, *Capt. Taylor*, &c. but that we find what lies there dispersed, to be so *Methodically Recapitulated*.

To Conclude this Treatise,

We will gratify the *Cider-Master* with the *Construction* of a new kind of *Press* brought into the *R. Society*, by their *Curator*, the ingenious *Mr. Hooke*, and is perfectly understood by him that shall imitate it, recommended not only for its extraordinary *Dispatch*, but for many other *virtues* of it, chiefly, the accurately grinding of the *Pulp*, and keeping the *Husks* from descending with the *Liquor*.



Explication of the Figures.

- a The *Axis*, by which four *Cylinders* are to be mov'd, either by the force of *Men*, *Horses*, *Wind*, or *Water*, &c.
 b. c. d Three of the 4 (visible) *Cylinders*, to placed, that those
 G g g 2 which

Concerning Cider.

which are first to *bruise* the *Apples*, may stand at about *half* an *Inch*, or less *distance* from each other: Those that are to press out the *juice* may join as *close*, as they can well be made to move.

f. f The *Trough*, in which to receive the *Liquor*, running through certain *holes* made in the lower *Plate* there marked.

e. e The *Hopper*, made *tapering* towards the *bottom*, in which you fling the *Apples*, and supply them as they *sink* towards the *Cylinders*. Note, That such another *Hopper* is suppos'd to be also made, and fitted to this *fore-part* of the *Press*, but here omitted, that the *prospect* and *description* of the *Cylinders* may the better be laid open and *demonstrated*.

g. g. g The *spindles* of each *Cylinder*.

b. b. i. i. k. k The *Frame*, consisting of two *Plates*, and two *Pilasters*, which hold the *Cylinders* together. Note, That the *Cylinders* must be made of excellent *Oaken* Timber, or other *hard* Wood; the *dimensions* about 3 *foot* long, one *foot* and half *diameter*: The rest of the *Frame* for *thickness*, &c. of *size* and *strength* proportionable.

l. l The *Legs* which support the *Frame*.

FIG. II.

Represents the *Ichnography* of the *First*.

But there are likewise other fresh inventions and *Ingenios* for the dispatch of this work, namely that of Mr. *Wolridges* of *Petersfield* in *Hampshire*; and more that you may find in an *Hortulan* advertisement communicated by the learned Dr. *Beale* to the late *Publisher* of the *Philosophical Transactions*, Vol. 12. Num. 134. p. 846. Where, when all are reckon'd up, the vulgar way of *pounding* the fruit in *Troughs*, made deep and strong with broad-footed *pounders*, is found inferior to none.

Kalendarium

Kalendarium Hortense.

OR THE

Gardners Almanac;

Directing what He is to do

MONTHLY,

THROUGHOUT THE

YEAR.

AND

What FRUITS and FLOWERS are in *Prime*.

The Fifth Edition, with many useful Additions.

By JOHN EVELYN, Esq; Fellow of the Royal Society.

Virg. Geo. 2. — Labor actus in orbem.



LONDON,

Printed for John Marry, Printer to the Royal Society. 1679.

TO
ABRAHAM COWLEY Esq.

Sir,



His Second Edition of my *Hortulan Kalendar* is yours, mindful of the honour once conferr'd on it, when you were pleas'd to suspend your nobler *Raptures*, and think it worthy your *transcribing*. It appears now with some *advantages* which it then wanted; because it had not *that* of publishing to the *World*, how infinitely I magnifie your *contempt* of (not to say *revenge* upon) it; whilst you still continue in the *possession* of your *Self*, and of that *repose* which few men understand, in exchange for those pretty *miseries* you have essay'd: O the sweet *Evenings* and *Mornings*, and all the *Day* besides which are yours,

-----while Cowley's made
The happy Tenant of the Shade!

And the Sun in his *Garden*, gives him all he desires, and all that he would enjoy; the purity of visible *Objects*, and of true *Nature* before she was vitiated by *Imposture* or *Luxury*!

-----Books, Wise Discourse, Gardens and Fields,
And all the joys that unmixt Nature yields,

Misc.

You gather the first *Roses* of the *Spring*, and *Apples* of *Autumn*: And as the *Philosopher* in *Seneca* desir'd only *Bread* and *Herbs* to dispute felicity with *Jupiter*; You vie happiness in a *thousand* easie, and sweet *Diversions*; not forgetting the innocent *Toils* which You cultivate; the *Leisure* and the *Liberty*, the *Books*, the *Meditations*, and above all, the learned and choice *Friendships* that you enjoy:


The Epistle Dedicatory.

enjoy : Who would not, like *You, Cacher sa vie ?* 'Twas the wise *Impress* of *Balzac*, and of *Plutarch* before him ; You give it *lustre* and *interpretation* : I swear to You, Sir, it is what in the World I most inwardly breathe after, and pursue, not to say that I envy Your *felicity*, deliver'd from the guilded *impertinences* of life, to enjoy the moments of a solid and pure *Contentment* ; since those who know how *usefully* You employ this glorious *Recess*, must needs be forc'd either to imitate, or, as I do, to celebrate Your *Example*.

J. EVELYN.

IN-

INTRODUCTION TO THE KALENDAR.

 Paradise (*though of Gods own Planting*) was no longer Paradise, than the Man put into it, continued to dress it and to keep it ; so, nor will our Gardens (as near as we can contrive them to the resemblance of that blessed Abode) remain long in their perfection, unless they are also continually cultivated. For when we have so much celebrated the life and felicity of an excellent Gard'ner, as to think it preferable to all other diversions whatsoever ; it is not because of the leisure which he enjoys above other men ; ease and opportunity which ministers to vain and insignificant delights ; such as Fools derive from sensual objects : We dare boldly pronounce it, there is not amongst Men a more laborious life than is that of a good Gard'ners ; but because a labour full of tranquillity and satisfaction, Natural and Instructive, and such as (if any) contributes to Piety and Contemplation, Experience, Health, and Longevity, munera nondum intellecta Deum : In sum, a condition it is, furnish'd with the most innocent, laudable, and purest of earthly felicities, and such as does certainly make the nearest approaches to that Blessed State, where only they enjoy all things without pains ; so as those who were led only by the light of Nature, because they could please none more glorious, thought it worthy of entertaining the Souls of their departed Heroes, and most illustrious of Mortals.

But to return to the Labour, because there is nothing excellent which is to be attain'd without it : A Gard'ners work is never at an end ; It begins with the Year, and continues to the next : He prepares the Ground, and then he Sows it ; after that he Plants, and then he gathers the Fruits ; but in all the intermedial spaces he is careful to dress it ; so as Columella, speaking of this continual assiduity, tells us, A Gard'ner is not only to reckon upon the loss of bare twelve hours, but of an whole Year, unless he perform what is at the present requisite in its due period ; and therefore is such a Monthly Notice of his Task as depends upon the Signs and Seasons highly

Prætermis-
duodecim ho-
ras, sed Annus
perisset, nullus
quæ quod in
stat effectus :
Quare, necessa-
ria est Mensuri cuiusque officii monitio ea, quæ pendet ex ratione Syderum Cœli, &c. Col. R. R. l. ix.

Gard'ners had need each *Star* as well to know, The *Kid*, the *Dragon*, and *Arcturus* too, As *Sea-men*, who through dismal storms are wont To pass the Oyster-breeding *Hellepont*.

—tam sunt Arcturi Sydera nobis
Hædiorumq; dies servandi, & lucidus
Anguis ;
Quam quibus in patriam ventosa per æ-
quora vellis
Pontus, & Ostreiferi fauces tentantur
Alydi. Geor. i.

H h h

necessary.

necessary. All which duly weigh'd, how precious the time is, how precipitous the Occasion, how many things to be done in their just Season, and how intolerable a confusion will succeed the smallest neglect, after once a Ground is in order, we thought we should not attempt an unacceptable Work, if here we endeavour to present our Gard'ners with a compleat Cycle of what is requisite to be done throughout every Month of the Year: We say, each Month; because by dividing it into Parts so distinct, the Order in which they shall find each particular to be dispos'd, may not only render the Work more facile and delightful; but redeems it from that extream perplexity, which for want of a constant and uniform Method, we find does so universally distract the vulgar sort of them: They know not (for the most part) the Seasons when things are to be done*; and when at any time they come to know, there often falls out so many things to be done on the sudden, that some of them must of necessity be neglected for that whole Year, which is the greatest detriment to this Mytery, and frequently irrecoverable.

We are yet far from imposing (by any thing we have here alledg'd concerning these Mensural Periods) those nice and hypercritical Puntillos which some Aitologers, and such as pursue their Rules, seem to oblige our Gard'ners to; as if, forsooth, all were lost, and our pains to no purpose, unless the Sowing and the Planting, the Cutting and the Pruning, were perform'd in such and such an exact minute of the Moon: In hac autem Ruris disciplina non desideratur ejusmodi scrupulositas. There are indeed some certain Seasons, and suspecta tempora, which the prudent Gard'ner ought carefully (as much as in him lies) to prevent: But as to the rest, let it suffice, that he diligently follow the Observations which (by great Industry) we have collected together, and here present him, as so many Synoptical Tables calculated for his Monthly use, to the end he may pretermitt nothing which is under his Inspection, and is necessary, or distract his Thoughts and Employment before the Seasons require it.

And now, however This may seem but a Trifle to some who esteem Books by the bulk, not the benefit; let them forbear yet to despise these few ensuing Pages: For never was any thing of this pretence more fully and ingeniously imparted; I shall not say to the regret of all our Mercenary Gard'ners, because I have much obligation to some above that Epithete; Mr. Rose, Gard'ner to His Majesty, and lately at Essex-house to Her Grace the Dutchess of Somerset; and Mr. Turner, formerly of Wimbleton in Surry; who being certainly amongst the most expert of their Profession in England, are no less to be celebrated for their free communications to the Publick, by drivers Observations of theirs, which have furnish'd to this Design. And it is from the Result of very much Experience, and an extraordinary inclination to cherish so innocent and laudable a Diversion, and to incite an Affection in the Nobles of this Nation towards it, that I begin to open to them so many of the interior Secrets, and most precious Rules of this Mysterious Art, without Imposture, or invidious Reserve. The very Catalogue of Fruits

* Quia caput est in omni negotio, posse quid agendum sit, &c. Columel. l. 1. c. 7.

Col. de R. R. l. 9. c. 364.

Fruits and Flowers, for the Orchard and the Parterre, will gratifie the most innocent of the Senses, and whoever else shall be to seek a rare and universal choice for his Plantation.

Touching the Method, it is so obvious, that there needs no further direction; and the Consequent will prove so certain, that a Work of the busiest pains is by this little Instrument rendered the most facile and agreeable, as by which you shall continually preserve your Garden in that perfection of beauty and lustre, without confusion or prejudice: Nor indeed could we think of a more comprehensive Expedient, whereby to assist the frail and torpent Memory through so multifarious and numerous an Employment (the daily subject of a Gard'ners care) than by the Oeconomy and Discipline which we have here consign'd it to, and which our Industrious Gard'ner may himself be continually improving from his own Observations and Experience. In the mean time, we have at the instance of very many Persons, who have been pleas'd to acknowledge the effects of a former less perfect Impression, thought good to publish an Edition in a smaller Volume, that as an Enchiridion it may be the more ready and useful; but the Kalendar might be considerably augmented, and recommend it self to more Universal use, by taking in the Monthly Employments of all the parts of Agriculture, as they have been begun to us in Columella, Palladius, de Serres, Augustino Gallo, Vincenzo Tanara, Herrera, our Tusser, Markham, and others; especially if well and judiciously applied to the Climate and several Countries: but it were here besides our Institution, nor would the Pages contain them; what is yet found vacant has been purposely left, that our Gard'ner may supply as he finds cause; for which reason likewise we have rang'd both the Fruits and Flowers in Prime after somewhat a promiscuous Order, and not after the Letters of the Alphabet, that the Method might be pursu'd with the least disorder. Lastly,

The Fruits and Flowers in Prime are to be as well considered in relation to their lasting and continuance, as to their maturity and beauty.

Col. de R. R. lib. 11. c. 11. Pall. lib. 1. Tit. 1.

J. E.

H h h 3

Kalendarium

Kalendarium Hortense.

Notes, that for the Rising and Setting of the Sun, and Length of the days, I compute from the first of every Month. London Lat.

Sun { rises 08^h.00^m } JANUARY { Hath days } long 8^h.00^m
 { sets 04.00 } { xxxi. }

To be done

In the Orchard, and Olitory-Garden.

Trench the Ground, and make it ready for the Spring: prepare also soil. See the directions in the Treatise of Earth, p. 317, &c. and be sure you suffer no weeds to grow upon your Compost: See also p. 325, 326, &c. and use it where you have occasion: Dig Borders, &c. uncover as yet Roots of Trees, where Ablaqueation is requisite.

Plant Quick sets, and Transplant Fruit-Trees, if not finish'd. Set * Vines, and begin to prune the old: Prune the branches of Orchard-fruit-trees; especially the long planted, and that towards the decrease: but for such as are newly planted, they need not be dis-branched till the Sap begins to stir, that the wound may be healed with the Scar, and Stub, which our frosts do frequently leave: In this work cut off all the shoot of August, unless the nakedness of the place incline you to spare it: Consult my French Gard'ner, part 1. sect. 3. for this is a most material Address, Pomona, c. 8. You may now begin to Nail, and trim your Wall-fruit, and Espaliers.

Cleanse Trees of Moss, &c. the Weather moist.

Gather Cyons for Grass: before the buds sprout; and about the latter end, Grass them in the Stock, Pears, Cherries and Plums, and remove your Kernel-stocks to more commodious distances in your Nursery, cutting off the * top-root: Set Beans, Peas, &c.

* Vide March.

Sow also (if you please) for early Caully-flowers. Sow Chervil, Lettuce, Radish, and other (more delicate) Sallets, if you will raise in the Hot-bed.

In over-wet, or hard weather, cleanse, mend, sharpen and prepare Garden-tools.

Turn up your Bee-hives, and sprinkle them with a little warm and sweet Wort; do it dextrously.

Fruits in Prime, and yet lasting.

Apples.

Kentish-pepin, Russet-pepin, Golden-pepin, French-pepin, Kirton-pepin, Holland-pepin, John-apple, Winter-Queening, Mari-gold, Harvey-apple, Pomewater, Pomeroi, Golden-Doucet, Reineting, Lower-Pearmain, Winter-Pearmain, &c.

Pears.

Winter-Musk (bakes well) Winter-Norwich (excellently baked) Winter-Bergamot, Winter-Bon-cressien, both Mural: the great Sur-rein, &c.

Sun { rises 08^h.00^m } JANUARY { Hath Days } long 8^h.00^m
 { sets 04.00 } { xxxi. }

To be done

In the Parterre, and Flower-Garden.

SET up your Traps for Vermine; especially in your Nurseries of Kernels and Stones, and amongst your Bulbous-Roots: About the middle of this Month, plant your Anemony-roots, and Ranunculus's, which you will be secure of, without covering, or farther trouble: Preserve from too great, and continuing Rains (if they happen) Snow and Frost, your choicest Anemonies, and Ranunculus's sow'd in September or October for earlier Flowers: Also your Carnations, and such Seeds as are in peril of being wash'd out, or over-chill'd and frozen; covering them under shelter, and striking off the Snow where it lies too weighty; for it certainly rots, and bursts your early-set Anemonies and Ranunculus's &c. unless plant-ed now in the Hot-bed; for now is the Season, and they will flower even in London. Towards the end, earth-up, with fresh and light mould, the Roots of those Auricula's which the frosts may have uncover'd; filling up the chinks about the sides of the Pots where your choicest are set: but they need not be hard'd; it is a hardy Plant.

Flowers in Prime, or yet Lasting.

Winter-Aconite, some Anemonies, Winter-Cyclamen, Black-Hellebor, Brunial-Hyacinth, Oriental-Jacinth, Levantine-Narcissus, Hepatica, Prim-rose, Laurustinus, Mezerion, Præcox Tulips, &c. especially, if rais'd in the Hot-bed. Note,

That both these Fruits, and Flowers, are more early, or tardy, both as to their prime Seasons for eating, and perfection of blowing, according as the Soil, and Situation are qualified by Nature, or Accident. Note also,

That in this Recension of Monthly Flowers, it is to be understood for the whole period that any Flower continues, from its first appearing to its final withering.

✕

Sun. { rises 07 ^h .13 ^m sets 04--45 }	FEBRUARY	{ Hath days xxviii. } long 9 ^b 24 ^m
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To be done

In the Orchard, and Olitory-Garden.

PRune *Fruit-trees*, and *Vines* as yet; For now is your Season to *bind*, *plest*, *naile*, and *dress*, without danger of *Frost*: This to be understood of the most tender and delicate *Wall-fruit*, not finished before; do this before the *buds* and *bearers* grow turgid; and yet in the *Nell-wine* and like delicate *Mural-fruit*, the later your *Pruning*, the better, whatever has been, and still is, the contrary custom; and let your *Gardner* endeavour to apply the *collateral* branches of his *mural* Trees, as near as possible he can to the *Bench* or *Bardure*; so as the *Fruit* (when it is grown) may almost touch the ground; the rest of the *Branches* following the same order, will display the *Tree* like a *Ladies-Fan*, and repress the common exuberance of the leading, and middle shoots, which usually make too hasty an advance. This is a precious note and to be chiefly practis'd at the first nailing of *Wall-Trees*, and *Epalieres*. Remove *Grafts* of former years *Grafting*. Cut, and lay *Quick-setts*, and trim up your *Palisade Hedges*, and *Epaliers*. Plant *Vines* as yet, *other Shrubs*, *Flora*, &c.

Set all sorts of *Kernels* and *Stone-Seeds*. Also sow *Beans*, *Pease*, *Romescuals*, *Corn-sallets*, *Marigolds*, *Avisseds*, *Radish*, *Paraspeps*, *Carrots*, *Onions*, *Garlick*, &c. and plant *Potatoes* in your worst ground.

Now is your Season for *Circumposition* by *Tubs* or *Baskets* of *Earth*, and for laying of *Branches* to take root. You may plant forth your *Cabbage-plants*.

Rub *Moss* off your *Trees* after a soaking *Rain*, and scrape and cleanse them of *Cankers*, &c. draining away the *wet* (if need require) from the too much moistned *Roots*, and earth up those *Roots* of your *Fruit-trees*, if any were uncovered. Cut off the *Webbs* of *Cattapillars*, &c. (from the *Tops* of *Twigs* and *Trees*) to burn. Gather *Worms* in the *Evenings* after *Rain*.

Kitchen Garden herbs may now be planted, as *Parley*, *Spinage*, and other hardy *Pot-herbs*. Towards the middle, or latter end of this *Month*, till the *Sap* rises briskly, *Graff* in the *Cleft*, and so continue till the last of *March*; they will hold, *Apples*, *Pears*, *Gageys*, *Plums*, &c. the *New-Moon*, and the *Old-Wood* is best. Now also plant out your *Caully flowers* to have early; and begin to make your *Hot-bed* for the first *Melons* and *Cucumbers* to be sowed in the *Fall*; but trust not altogether to them! Sow *Asparagus*. Lastly, Half open your *passages* for the *Bees*, or a little before (if weather invite;) but continue to feed weak *Sticks*, &c.

✕

Fruits in Prime, or yet lasting.

Apples.

Kentish, *Kirton*, *Russet*, *Holland* *Pepins*, *Denzans*, *Winter Queening*, *Harvey* sometimes, *Pome-water*, *Pome-ray*, *Golden Doucet*, *Reinzing*, *Leiter* *Pearmain*, *Winter Pearmain*, &c.

Pears.

Ben-Christien of *Winter*, *Winter Popping*, *Little Dagobert*, &c.

✕

Sun. { rises 07 ^h .13 ^m sets 04--45 }	FEBRUARY	{ Hath Days xxviii. } long 09 ^h .24 ^m
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To be done

In the Parterre, and Flower-Garden.

Continue *Vermine Traps*, &c.

Sow *Alaternus* seeds in *Cases*, or *open Beds*; cover them with *thorns*, that the *Poultry* scratch them not out. Sow also *Larkspurs*, &c.

Now and then air your house *Carnations*, in *warm* days especially, and mild *showers*; but if like to prove *cold*, set them in again at night.

Furnish (now towards the end) your *Aviaries* with *Birds* before they couple, &c.

✕

Flowers in Prime; or yet lasting.

Winter *Aconite*, single *Anemones*, and some double, *Tulips* *præcoce*, *Hyacinthus Stellatus*, *Vernal Crocus*, *Black Helibore*, single *Hepatica*, *Persian Iris*, *Leucoium bulbosum*, *Dens Caninus* three-leav'd, *Vernal Cyclamen* white and red, *Mezerion*, *Ornithogal*. max. alb. *Yellow Violets* with large leaves, early *Daffodils*, &c.

V

Sun $\left\{ \begin{array}{l} \text{rises } 06^h 19^m \\ \text{sets } 05^h 41^m \end{array} \right\}$ MARCH $\left\{ \begin{array}{l} \text{Hath days } \\ \text{xxx.} \end{array} \right\}$ long $11^h 22^m$

To be done

In the Orchard, and Olitory-Garden.

YET *Stercoration* is seasonable, and you may plant what *Trees* are left, though it be something of the latest, unless in very backward season, or moist places.

Now is your chiefest and best time for raising on the Hot-bed *Melons*, *Cucumbers*, *Gourds*, &c. which about the *sixth*, *eighth*, or *tenth* day will be ready for the Seeds; and eight days after prick them forth at distances, according to the Method, &c.

If you will have them later, begin again in ten or twelve days after the first; and so a third time to make Experiments. Remember to preserve the Hot-bed as much as possible from *Rains*, for cool him you may easily if too violent, but not give it a competent heat if it be spent, without new-making. See *Dife* of Earth, &c.

Graft all this Month, beginning with *Pears*, and ending with *Apples*, unless the Spring prove extraordinary forwards. See *Pomona*, cap. 3.

Now also plant *Peaches* and *Nectarines*, early, but cut not off the top-roots, as you do of other Trees; for 'twill much prejudice them: Prune last years Grays, and cut off the heads of your budded stocks. Take off the *Latter* from your Kernel-beds; see *Orchid.* or you may forbear till *April*. Stir your sown-plant grounds as taught in *Dife* of Earth, p. 299. and for the *Nursery*, p. 300. You may as yet cut *Quicksets*, and cover such *Tree-roots* as you laid bare in *Autumn*.

It were profitable now also to top your *Rose-trees* a little with your Knife, near a leaf-bud, and to prune off the dead and withered branches, keeping them lower than the custom is, and to a single Stem.

Slip, and set *Sage*, *Rosemary*, *Lavender*, *Thyme*, &c. Sow in the beginning *Endive*, *Succory*, *Lett.*, *Radish*, *Beet*, *Chard Beet*, *Scorzenera*, *Paraslop*, *Scurrets*, *Parley*, *Sorrel*, *Buzelos*, *Borage*, *Chervil*, *Sellery*, *Smallage*, *Asparagus*, &c. Several of which continue many years without renewing, and are most of them to be blanch'd by laying them under *litter* and earthing up.

Sow also *Leaves*, *Onions*, *Garlick*, *Orach*, *Parflum*, *Turneps* (to have early) monthly *Peeff* &c. these *annually*.

Transplant the *Beet chard* which you sowed in *August*, to have most ample *Chards*.

Sow also *Carrots*, *Cabbages*, *Cresset*, *Fennel*, *Majoran*, *Basil*, *Tobacco*, &c. And transplant any sort of Medicinal Herbs.

Mid-March dress up, and bring your *Strawberry* beds, and uncover your *Asparagus*, spreading and loosning the Mold about them, for their more easy penetrating: Also may you now transplant *Asparagus* roots to make new Beds: See *Dife* of Earth, p. 322.

By this time your *Beet* fit; keep them close Night and Morning, if the weather prove ill.

Turn your *Fruit* in the Room where it lies, but open not yet the windows.

Fruits in Prime, and yet lasting.

Apples.

Golden Ducket, [Douce] Pepins, Keineting, Loves Pearmain, Winter Pearmain, John Apple, &c.

Pears.

Later Bon-Christien, Double Blossom Pear, &c.

V

Sun $\left\{ \begin{array}{l} \text{rises } 06^h 19^m \\ \text{sets } 05^h 41^m \end{array} \right\}$ MARCH $\left\{ \begin{array}{l} \text{Hath Days } \\ \text{xxxi.} \end{array} \right\}$ long $11^h 22^m$

To be done

In the Parterre, and Flower-Garden.

Stake, and bind up your weakest Plants and Flowers against the Winds, before they come too fiercely, and in a moment prostrate a whole year's labour.

Plant Box, &c. in Parterre: Sow *Pinks*, *Sweet-williams*, and *Carnations*, from the middle to the end of this Month. Sow *Pink-burnels*, *Fir-jeds*, *Bays*, *Alaterns*, *Phillyria*, and most perennial Grains, &c. Or you may say till somewhat later in the Month. Sow *Auricula-fids* in pots or casts, in fine *willow* earth, a little loamy, and place what you sow'd in *September* (which is the more proper Season) now in the shade, and water it.

Plant some *Anemone* roots to bear late, and successively; especially in, and about *London*, where the *Smoke* is any thing tolerable; and if the Season be very dry, water them well once in two or three days, as likewise *Ranunculus*'s. Fibrous roots may be transplanted about the middle of this Month; such as *Hyacinths*, *Primroses*, *Auricula*'s; *Camomills*, *Hyacinths*, *Tulips*, *Matricaria*, *Gentianella*, *Hillbore* and other Summer Flowers; See *Locum* or Slip the *Kris* or *Wall-flower*; and towards the end, *Lupins*, *Consouidion*'s, *Spanish*, or ordinary *Ysop*. You may now a little after the *Equinox*, prune *Pink* and *Fir-trees*: See *September*.

Towards the middle, or latter end of March sow on the Hot-bed such Plants as are like bearing Flowers or Fruit in our Climate; as *Balsamine*, and *Balsamum mas*, *Pomum Aneis*, *Datura*, *Aethiopic* Apples, some choice *Amaranthus*, *Delphin*, *Organum*, *Hyssopus*, *Cyperus*, *Humilis*, and *Sensitive* Plants; *Leontice*, *Myrtus-hurris* (they'd a while) *Cassia* *indica*, *Cassia* *hedge*, *Flos Africanus*, *Mirabile* *Peruvian*, *Nigella* *indica*, *Indica* *Phlox*, *Trachelium*, *Scorbut*, *Maroon*, five *Flos Passiflora*, and the like rare, and exotic Plants which are brought us from far Countries. Note, that the *Naturum* ind. *African* *Margold*, *Valeriana*, and some others, will come (though not altogether to forwards) in the cold-bed without *Art*: But the rest require much, and constant heat, and therefore several Hot-beds, till the common earth be very warm by the advance of the Sun, to bring them to a due stature, and perfect their Seeds: Therefore your choicest *Amaranthus* being risen pretty high, remove them into another temperance; Hot-bed's the same you may do with your *African*, and *Sensitive* Plants, especially, which at-ways keep under Glasses: For the making the Hot-bed, See *Dilection* of Earth, p. 324.

About the expiration of this Month carry into the shade such *Auricula*'s, Seedlings, or Plants as are for their choiceness reserved in Pots.

Transplant also *Carnation* seedlings, giving your Layers fresh earth, and setting them in the shade for a week; then likewise cut off all the sick and infected leaves; for now you may set your choice ones out of cover as directed in *February*.

Now do the farthest; frost, and Easterly winds prejudice your choicest Tulips, and spot them; therefore cover such with Mats or Canvas to prevent frosts and sometimes pestilence. The same care have of your most precious *Adonis*, *Auricula*'s, *Chamaeiris*, *Bromus*, *Asperula*, *Cyclamen*, &c. Wrap your thorn Cypress tops with straw-hops, if the Easterly blasts prove very tedious, and forget not to cover with dry straw, or Peat bams, your young exposed *Eur-*greens as yet Seedlings; such as *Pink*, *Pink*, *Phillyria*, *Bays*, *Cypress*, &c. till they have pass'd two or three years in the *Nursery*, and are fit to be transplanted; for the sharp Easterly and Northerly winds transpire, and dry them up. Let this also caution you upon all such extremities of the seasons and intermissions; it being these acute Winds, and seldom, or never the hardest frosts, or snows which do the mischief: About the end uncover even your choicest Plants, but with caution; for the rail of the Frosts yet continuing, and sharp Winds, with the sudden daring heat of the Sun, scorch and destroy them in a moment: and in such weather neither sow nor transplant.

Sow *Stock-gilly-flower* seeds in the Fall, to produce double flowers.

Now may you set your *Grange*, *Lemnos*, *Myrtus*, *Olanders*, *Leontice*, *Datte*, *Alot*, *Ammann*, and like tender Trees and Plants in the Parterre, or with the windows, and doors of the Green-houses and Conservatories open for eight or ten days before April, or earlier, if the Season invite (that is, if the sharp winds be past) to acquaint them gradually with the Air; I say, gradually and carefully; for this change is the most critical of the whole year; trust not therefore the Seeds too confidently, until the weather be thoroughly settled: Now is also your Season to raise the Stocks to bud *Orange* and *Lemnos* on, by sowing the Seeds; and some of the hardest Evergreens may be transplanted, especially, if the weather be moist and temperate.

Lastly, Bring in materials for the Birds in the *Avary* to build their Nests withal.

Flowers in Prime, and yet lasting.

A Nemones, Spring Cyclamen, Winter Aconite, Crocus, Allis, white and black Hillbore, single and double Hyacinths, Leucoion, Chamaeiris of all colours, Dore crinitus, Pinks, Primroses, Chelidonium small with double Flowers, Hermodactyls, Tulipursus, Iris, Hyacinth Zebinus, Bromus, Geranius, &c. Junquils, great Chelid, Dutch Maroon, Persian Iris, Auricula's, Narcissus with large tufts, common, double and single. Primroses, Peacock Tulips, Spanish Trumpets or Juncquills, Violets, yellow Dutch Violets, Orientalis glauca mas. alb. Crown Imperial, Grape Flowers, Anemons and Peach blossoms, Rubus odoratus, Arise Jade, &c.

Sun { rises-05^h.18^m
sets-06--42 }

APRIL

{ Hath days
xxx. } long-13^h 23^m

To be done

In the Orchard, and Oltory-Garden.

Sow sweet *Majoram*, *Hyssop*, *Basil*, *Thyme*, *Winter-Savory*, *Scurey-grass*, and all fine and tender seeds that require the Hot-bed.

Sow also *Lettuce*, *Purslan*, *Canly-flower*, *Radish*, &c.

Plant *Artichock-slips*, &c.

Set *French-beans*, &c. and sow *Turneps* to have them early.

You may yet slip *Lavender*, *Thyme*, *Peneroyal*, *Sage*, *Rosemary*, &c.

Towards the middle of this Month begin to plant forth your *Melons*, and *Cucumbers*, and so to the latter end; your *Ridges* well prepar'd.

Gather up *Worms*, and *Snails*, after evening flowers; continue this also after all Summer-rains: *Weed*, and *Haw* betimes. See *July*: In those *Borders* where you plant *Wall-fruit*, or *Espalieres* (which *Borders* should be at the least four or five foot in breadth) plant neither *Herbs* nor *Flowers*, that you may be continually stirring it with the *Spade*, and refreshing it with *composts*, which should be instead of hand weeding; only you may give the outward verge an edging of *Pink*, *Limon-tine*, &c. renewing them when you perceive them to grow *stickie*, and leave gaps: and you may sprinkle the rest with *Lettuce-feed*, to pluck up roots and leaf for tender *salading*, when their leaves are as broad as a *Six-pence*.

Open now your *Bee-hives*, for now they hatch; look carefully to them, and prepare your *Hives*, &c.

Fruits in Prime, or yet lasting.

Apples.

Pepins, *Deuxans*, *West-berry-apple*, *Russeting*, *Gilly-flowers*, *Flat Reinets*, &c.

Pears.

Later *Bon-crestien*, *Oak-pear*, &c. double *Blossom*, &c.

Sun { rises-05^h.18^m
sets-06--42 }

APRIL

{ Hath Days
xxx. } long-13^h 23^m

To be done

In the Parterre, and Flower-Garden.

Sow divers *Annals* to have *Flowers* all Summer; as double *Marigolds*, *Digitalis*, *Delphinium*, *Cyanus* of all sorts, *Candy-tuft*, *Garden Pansy*, *Medicinalis*, *Scabrous*, *Scorpioides*, *Medica*, *pernice*, &c.

Continue now, and seth *Hot-beds* to entertain such *exotic* Plants as arrive not to their perfection without them, till the *Air* and *common earth* be qualified with sufficient warmth to preserve them abroad: A Catalogue of these you have in the former Month.

Transplant such *Fibrous-roots* as you had not finish'd in *March*; as *Violets*, *Hepatica*, *Primrose*, *Hillier*, *Matricaria*, &c. Place *Auricula* Seedlings in the shade.

Sow *Pinks*, *Carnations*, which you may continue to trim up, and cleanse from dead and rotten leaves, viz. your old roots: Sow *Sweet-Williams*, &c. to flower next year: this after rain.

Set *Lupinus*, &c.

Sow *Lacium* in Full-Moon, sprinkle it thin, frequently remove them, and replant in moist weather the following Spring.

Sow also yet *Pine-apples*, *Fir-seeds*, *Phillyrea*, *Alaternus*, and most perennial Greens. Vide *Sept*.

Now take out your *Indian Tuberoses*, paring the Offsets (but with care, lest you break their *fangs*) then put them in * natural (not forc'd) Earth; a layer of rich mold beneath, and about this, natural earth to nourish the fibres, but not so as to touch the Bulbs: then plunge your pots in a Hot-bed temperately warm, and give them no water till they spring, and then sit them under a South-wall: In dry weather water them freely, and expect an in-comparable flower in August. Thus likewise treat the *Narcissus* of *Japan*, or *Garnet-Lily*, warm corner, expos'd to the South, without any removal at all for many years, has sometimes the profusest *fangs* of the *Tuber* are to be treated like the *Tuberoses*. Make much of this precious Direction.

Set out and expose *Flos Cardinalis*: Slip, and set *Morone*; *Water Anemones*, *Ranunculus*, and Plants in Pots and Casks once in two or three days, if drought require it. But carefully proceed from violent forms of Rain, Hail, and the too parching darts of the Sun, your ed on cradles of hoops, which have now in readiness. Now is the Season for you to bring the forth in March: let it be in a fair day; only your *Orange-trees* may remain in the house till *March*, to prevent all danger: See the caution in May: You may now graft these tender *fruits*, &c. by Approach, viz. *Oranges*, *Lemons*, *Pomgranades*, *Jasmines*, &c.

Now, towards the end of April, you may Transplant, and Remove your tender shrubs, &c. as *Spanish Jasmin*, *Myrtles*, *Oleanders*, young *Oranges*, *Cyclamens*, *Pomgranades*, &c. But first let them begin to sprout; placing them a fortnight in the shade; but about London it may be better to defer this work till mid-August: Vide also May, from whence take Directions how to refresh and trim them: prune now your *Spanish Jasmin* within an inch or two of the stock; but first let it be in a fair day. Now *Carpenter-walks*, and ply *Wedding*, with timely hewing, &c.

Towards the end (if the cold winds are past) and especially after showers, clip *Phillyrea*, *Alaternus*, *Cypripis*, *Box*, *Myrtles*, *Barba Jovis*, and other tosylle shrubs, &c.

Flowers in Prime, or yet lasting.

A *Nemans*, *Ranunculus*, *Auricula* *Oris*, *Chame-iris*, *Crown Imperial*, *Caprifolium*, *Cyclamen*, *bell-flowers*, *Dianthus*, *Carinus*, *Fritillaria*, *Geniavilla*, *Hypericum* *frutx*, double *Hepatica*, *Jacynth* starry, double *Daisies*, *Florunda*, *tufted Narcissus*, white, double and common, *English double*: *Primrose*, *Cornflower*, *Pastillia*, *Ladys-Smock*, *Thiopsis medius*, *Ranunculus* of *Tripoli*, white *Violets*, *Musk-Grape-flower*, *Granium*, *Radix* *Cava*, *Caltha palustris*, *Parianaria* *Latus*, *Lincolnum*, *Persian Lillies*, *Paeonies*, double *Jasmin*, *Muscaria* *revers'd*, *Cochlearia*, *Persian Jasmin*, *Acanthus*, *Lilac*, *Rosemary*, *Cherries*, *Wall-pears*, *Almonds*, *Abricots*, *Peaches*, *White-thorn*, *Alvor* *Julia* blooming, &c.

II

Sun { rises 04 ^h 25 ^m } { sets 07--35 }	MAY	{ Hath days } { xxxi. }	{ long 15 ^h 09 ^m }
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To be done

In the Orchard, and Olitory-Garden.

SOW Sweet Majoran, Basil, Thyme, hot and Aromatic Herbs and Plants which are the most tender.

Sow Purslan, to have young: Lettuce, large-sided Cabbage, painted Beans, &c.

Look carefully to your Mellons; and towards the end of this Month, forbear to cover them any longer on the Ridges either with Straw, or Matresses, &c. stir up new planted grounds, see March.

Plow the Laboratory, and distill Plants for Waters, Spirits, &c. Continue Weeding before they run to Seeds, most carefully observing the directions of April and July, which are of extraordinary importance both for the saving of charge, improvement of Fruit, and the neat maintaining of the Gardens.

Now set your Bees at full Liberty, look out often, and expect Swarms, &c.

Fruits in Prime, or yet lasting.

Apples.

Pepins, Deuxans or Jobn-apples, West-berry-apples, Russeting, Gilly-flower-apples, the Maligar, &c. Codling.

Pears.

Great Kairville, Winter Bon-Cretienne, Black-pear of Worcester, Durain, Double-Blossom-pear, &c.

Cherries, &c.

The May-Cherry. Strawberries, &c.

II

Sun { rises 04 ^h 25 ^m } { sets 07--35 }	MAY	{ Hath Days } { xxxi. }	{ long 15 ^h 09 ^m }
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To be done

In the Parterre, and Flower-Garden.

Now bring your Oranges, &c. boldly out of the Conservatory; 'tis your only Season to Transplant and Remove them: let the Cases be fill'd with natural earth (such as is taken the first half spit from just under the Turf of the best Pasture ground, in a place that has been well soother'd on) mixing it with one part of rotten Cow-dung, or very mellow Soil screen'd, and prepar'd some time before; if this be too stiff, sift a little Lime discreetly with it, with the rotten sticks of Willows; if it want binding, a little Loam: Then cutting the too thick and extravagant Roots a little, especially at bottom, set your Plants; but not too deep; rather let some of the Roots appear: Lastly, settle it with temperately enrich'd water (such as is impregnated with Neat and Sheep-dung especially, set, and stir'd in the Sun some few days before; but be careful, not to drench them too much at first; but giving it by degrees day after day, without touching with it the Stem;) having before put some handfuls of Lime-stones, pebbles, shells, Egg-spray, or the like at the bottom of the Cases, to make the moisture passage, and keep the earth loose for fear of rotting the fibres: See November. Then set them in the shade for a fortnight, and afterwards expose them to the Sun; in this therefore be not over hasty, especially if the season be scorching; for in your direct acquainting them with this change, will consist their prosperity all the Summer after. The best shade for this first exposure, were behind a thin hedge, or Curbin drawn before them, which may be now and then sprinkled with water, as the Seamen do their Sails. See discourse of Earth, p. 333.

Give now also all your bous'd plants (such as you do not think requisite to take out) fresh Earth at the surface, in place of some of the old Earth (a hand-depth or so) and loosning the rest with a fork, without wounding the Roots: let this be of excellent rich * soil, such as is thoroughly consumed, and will fift, * Vide July. that it may wash in the vertue, and comfort the Plant: Brush, and cleanse them likewise from the dirt contracted during their Enclasure. These two last directions have till now been kept as considerable Secrets amongst our Gard'ners: vide August and September.

Shade your Carnations, and Gilly-flowers after mid day about this Season: Plant also your Stock-gilly flowers in beds, full Moon.

Continue watering Ranunculus's: Transplant forth your Amarantus's, where you would have them stand: Sow Antirrhinum; or you may set it.

Gather what Anemone seed you find ripe, and that is worth saving, preserving it very dry.

Cut likewise the stalks of such Bulbous flowers as you find dry. Towards the end take up those Tulips which are dry'd in the stalk; covering what you find to lie bare from the Sun and flowers.

Flowers in Prime, or yet Lasting.

Late set Anemones and Ranunculus omni. gen. Anapodophylon, Blattaria, Chamairis, Angustifol. Cyanus, Cytisus, Maranthus, Cyclamen, Heleborus, Columbinus, Caltha palustris, double Cotyledon, Digitalis, Fraxinella, Gladiolus, Geranium, Hornum Creticum, yellow Hemerocallis, Risp'd Jacynth, early Bulbous Iris, Aphodet, yellow Lillies, Lychnis, Jacca, Bellis, double, white and red, Millefolium luteum, Phalangium, Orchis, Lilium Corvialium, Span. Pink, Depford Pink, Rosa common, Cinnaom, Guelder & Centifol. &c. Oleaster, Chery-bay, Trachelium, Cowslips, Helperis, Antirrhinum, Spring's, Sedums, Tulips scrocin, &c. Valerian, Veronica double and single, Musk Violet, Ladies Slipper, Belvidere, Stock-gilly flowers, Spanish Nut, Star-flower, Chalcidons, ordinary Crow-foot, red Martagon, Bee-flowers, Campanula's white and blue, Persian Lilly, Hony-suckles, Bugloss, Homers Moly, and the white of Discorides, Pansies, Prunella, purple Thalictrum, Silybrium double and simple, Leucoium bulbosum serotinum, Peonies, Sambucus, Rosemary, Stachas, Sea-Narcissus, Barba Jovis, Laurus, Satyrion, Oxyacanthus, Tamariuscus, Apple-blossoms, &c.

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Sun { rises 03^h 51^m }
 { sets 08^h 09^m }

JUNE

{ Hath days }
 { xxx. } long 16^h 17^m

To be done

In the Orchard, and Oltory-Garden.

Sow Lettuce, Chervil, Radish, &c. to have young, and tender salleting.

About the midst of June you may Inoculate Peaches, Abricots, Cherries, Plums, Apples, Pears, &c.

You may now also (or in May before) cleanse Vines of exuberant branches and tendrils, cropping (not cutting) and stopping the second joint immediately before the Fruit, and some of the under branches which bear no fruit; especially in young Vineyards when they first begin to bear, and thence forwards; binding up the rest to props. Directions for the Nursery this Months beginning, see Discourse of Earth, p. 300. and for Ortyards, 327.

Gather Herbs in the Full to keep dry; they keep and retain their virtue and sweet smell better dry'd in the shade than Sun, whatever some pretend.

Now is your Season to distill Aromatick Plants, &c.

Water lately planted Trees, and put moist, and half rotten Fearn, &c. about the foot of their Stems, having first clear'd them of weeds, and a little stirred the earth.

Look to your Bees for Swarms, and Casts; and begin to destroy Insects with Hoofs, Canes, and tempting baits, &c. Gather Snails after Rain, &c.

Fruits in Prime, or yet lasting.

Apples.

Juniting (first ripe) Pepins, John-apples, Robillard, Red Fenouil, &c. French.

Pears.

The Mandlin (first ripe) Madera, Green-Royal, St. Laurence-pear, &c.

Cherries, &c.

Black.

Duke, Flanders, Heart

Red.

White.

Luke-ward, early Flanders, the Common-Cherry, Spanish-black, Naples Cherries, &c.

Rasberries, Corinths, Straw-berries, Melons, &c.

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Sun { rises 03^h 51^m }
 { sets 08 09 }

JUNE

{ Hath Days }
 { xxx. } long 16^h 17^m

To be done

In the Parterre, and Flower-Garden.

Transplant Autumnal Cyclamens now if you would change their place, otherwise let them stand. Take up Iris Chalcedon.

Gather the ripe Seeds of Flowers worth the saving as of choicest Oriental Jacynth, Narcissus (the two lesser, pale spurious Daffodils of a whitish green, often produce varieties) Auriculas, Ranunculus, &c. and preserve them dry: Shade your Carnations from the afternoon Sun.

You may now begin to lay your Gilly-flowers.

Take up your rarest Anemonies, and Ranunculus: after rain (if it come seasonable) the stalk wither'd, and dry the roots well: This about the end of the Month: In mid-June inoculate Jasmine, Rose, and some other rare shrubs. Sow now also some Anemony-seeds. Take up your Tulip-bulbs, burying such immediately as you find naked upon your beds; or else plant them in some cooler place; and refresh over-parch'd beds with water. Water your pots of Narcissus of Japan (that rare Flower) &c. Stop some of your Scabiosa from running to seed the first year, by now removing them, and next year they will produce excellent flowers. Also may you now take up all such Plants and Flower-roots, as endure not well out of the ground, and replant them again immediately; such as the early Cyclamen, Jacynth Oriental, and other bulbous Jacinths, Iris, Pritillaria, Crown-Imperial, Martagon, Muscaris, Demi Caninus, &c. The slips of Myrsine in some cool and moist place do now frequently take root: Also Cytisus lunatus will be multiplied by slips in a moist place, such as are a handful long of that Spring, but neither by Seeds or Layers. Look now to your Aviary; for now the Birds grow sick of their Feathers; therefore assist them with Emulsions of the cooler seeds bruised in their water, as Melons, Cucumbers, &c. Also give them Succory, Beets, Groundsel, Chick-weed, fresh Gravel and Earth, &c.

Flowers in Prime, or yet Lasting.

A Maranthus, Antirrhinum, Asphodel, Campanula, Convolvulus, Cyclamen, Clematis Pannonica, Cyanus, Blattaria, Digitalis, Gladiolus, Hedyсарum, Geranium, Horminum Creticum, Hieracium, Hesperis, bulbous Iris, and divers others, Lychnis var. generum, Martagon white and red, Millefolium white and yellow, Nasturtium Indicum, Nigella, After Atleius, Heliober Alb. Gentiana, Trachelium, Ficus Indica, Fraxinella, shrub Night-shade, Jasmine, Honey-suckle, Bellvidere, Genista Hisp. Carnations, Pinks, Armerius, Ornithogalum, Pansy, Phalangium Virginianum, Lark-beel early, Philo-sella, Rose, Thlaspi Creticum, &c. Veronica, Viola pentaphyl. Campions or Spilanti, Mountain Lillies white, red: double Poppies, Palma-Christi, Stock-gilly-flower, Corn-flag, Holly-hoc, Muscaris, Serpilum Citratum, Phalangium Alabrogicum, Orange, Balsamary, Lentsui, Pomegranate, the Lime-tree, &c.

Sun {rises 04^h 00^m
sets 08^h 00^m} JULY {Hath days
xxxi. } long 15^h 59^m

To be done

In the Orchard, and Olitory-Garden.

Sow Lettuce, Raddish, &c. to have tender salletting.

Sow later Peas to be ripe six weeks after Michaelmas.

Water young planted Trees, and Layers, &c. and re-prune now Apricots, and Peaches, saving as many of the young likeliest shoots as are well placed; for the now Bearers commonly perish, the new ones succeeding: Cut close and even, purging your Wall-fruit of superfluous leaves which hinder from the Sun; but do it discreetly. Stir up new planted grounds, see March.

You may now also begin to inoculate.

Let such Olitory-herbs run to seed as you would save.

Towards the later end, visit your Vineyards again, &c. and stop the exuberant shoots at the second joint above the fruit (if not finish'd before); but not so as to expose it to the Sun, without some umbrage.

Remove long-tided Cabbages planted in May, to head in Autumn; 'tis the best Cabbage in the World.

Now begin to frighten the entrance of your Bees a little; and help them to kill their Drons if you observe too many; setting the new-invented Curcubit-Glasses of Beer mingled with Honey, to entice the Wasps, Flies, &c. which waste your store: Also hang Bottles of the same Mixture near your Red-Roman-Nectarines, and other tempting Fruits, for their destruction; else they many times invade your best Fruit.

Look now also diligently under the leaves of Mural-Trees for the Snails; they stick commonly somewhat above the fruit: pull not off what is bitten; for then they will certainly begin afresh.

Keep your Weeds down, that they grow not to Seed, and begin your work of homing, so soon as they begin almost to peep; by this means you will dispatch more in a few hours, than afterwards in a whole day; whereas if you neglect it till they are ready to seed, you do but stir and prepare the earth for a more numerous crop, and your ground shall never be clear'd.

Fruits in Prime, or yet lasting.

Apples.

Dear-ant, Pepins, Winter Russetting, Andrew-apples, Cinnamon-apples, red and white Junting, the Margaret apple, &c.

Pears.

The Primat, Russet pears, Summer-pear, green Chesh-pears, Pearl-pear, &c.

Cherries.

Carnations, Morella, Great-beaver, Morocco-Cherry, the Egriot, Bigarreaux, &c.

Peaches.

Nutmeg, Isabella, Persian, Newington, Violet-muscate, Rambouillet.

Plums, &c.

Primordial, Myrobolan, the red, blue, and amber Violet, Damasc. Denny Damasc. Pear-plum, Damasc. Violet, or Cheshon-plum, Apricot-plum, Cinnamon-plum, the Kings-plum, Spanish, Morocco-plum, Lady Eliza-plum, Tawny, Damascen, &c. Rauberrie, Goose-berries, Cornish, Strawberry, Melons, &c.

Sun {rises 04^h 00^m
sets 08 00 } JULY {Hath Days
xxxi. } long 15^h 59^m

To be done

In the Parterre, and Flower-Garden.

Slip Stocks, and other lignous Plants and Flowers: From henceforth to Michaelmas you may also lay Gilly-flowers, and Carnations for increase, leaving not above two, or three spindles for flowers, and nipping off superfluous buds, with supports, cradles, canes, or hoops, to establish them against winds, and destroy Earwigs.

The Layers will (in a month or six weeks) strike root, being planted in a light loamy earth, mix'd with excellent rotten soil and sifted: plant six, or eight in a pot to save room in Winter: keep them well from too much Rain; yet water them in drouth, sparing the leaves: If it prove too wet, lay your pots side-long; but shade those which blow from the afternoon Sun; as in the former Month.

Yet also you may lay Myrtles, Laurels, and other curious Greens.

Water young planted Stocks and Layers, &c. as Orange-Trees, Myrtles, Granads, Anomum especially, which shoud you can hardly refresh too often; as it requires abundant composs; so do likewise both the Myrtles and Granad-Trees; therefore whenever you trim their Roots, or change their Earth, apply the richest soil (so it be sweet, and well consum'd) you can to them, &c. Clip Box, &c. in Parterres, Knots, and compartments, if need be, and that it grow out of order; do it after Rain.

Graft by Approach, Inarch, or Inoculate Jasmines, Oranges, (see August) and other your choicest Shrubs.

Take up your early autumnal Cyclamen, Tulips, and Bulbs (if you will Remove them, &c.) before mention'd; transplanting them immediately, or a Month after if you please, and then cutting off, and trimming the fibres, spread them to dry in some dry place.

Gather Tulip-seeds, if you please; but let it lie in the pots.

Gather now also your early cyclamen-seeds, and sow it presently in Pots.

Remove ice-ling Crocus; sow'd in September constantly at this Season, placing them at wider intervals, till they begin to bear.

Likewise you may take up some Anemonies, Ranunculus, Crocus, Crown Imperial, Persian Iris, Fritillaries, and Calceoliums; but plant the three last as soon as you have taken them up, as you did the Cyclamens; or you may flay till August or September ere you take them up, and replant Calceoliums.

Remove now Dens Caninus, &c.

Take up your Gladiolus now yearly, the blades being dry, or else their Off-sets will poison the ground.

Latter end of July, stir your Beds for Off-sets of Tulips, and all Bulbous Roots; also for Anemonies, Ranunculus, &c. which will prepare it for re-planting with such things as you have ready in Pots to plunge, or set in the naked earth till the next season; as Amaranths, Canna Ind. Mirabilis Petrus, Caspium Ind. Nafortium Ind. &c. that they may not lie empty and disfigured.

You may sow some Anemonies, keeping them temperately moist.

Continue to cut off the withered stalks of your lower flowers, &c. and all others, covering with earth the bare roots, &c.

Now (in the driest Season) with Brins, Pot-ashes, and Water, or a decoction of Tobacco refresh, water your Gravel-walks, &c. to destroy both Worms and Weeds, of which it will cure them for some years.

Flowers in Prime, or yet Lasting.

A Maranthus, Aphodol, Antirrhinum, Campanula, Clematis, Cyanus, Convolvulus, Saltau, Veronica purple and odoriferous, Digitalis, Eryngium Plannum, Ind. Phloxes, Geranium trisul, and Crestum, Gladiolus Gentiana, Hesperis, Nigella, Hydrocarum, Fraxinella, Lychnis Galathea, Jussia, white and double, Nafort. Ind. Wallflower, Musk-ros, Flos Africanus, Thapsi Criticum, Veronica mag. & parva, Valeriana, Bellam-apile, Helyon, Core-flower, Alkekengi, Lupinus, Scorpion-grass, Caryophyllata omni. gen. Stock-gilly flower, Scabiosa, Mirab. Peru. Spartum Hispan. Monthly-rose, Jasmin, Indian Tobacco Jacynth, Limonium, Linaria Critica, Pansies, Prunella, Delphinium, Dianthus, Paeonia Virgin. Flos Passiflora, Flos Caradinalis, Tacea, Oranges, Anomum Plurim, Oldanders red and white, Agnus Castus, Arbutus, Olive, Ligustrum, Tilia, &c.

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Sun { rises-04^h.43^m } **AUGUST** { Hath days } long 14^h.33^m
 { sets-07^h.17^m } { xxxi. }

To be done

In the Orchard, and Olitory-Garden.

Inoculate now early, if before you began not, and gather your bud of that year: Let this work be done before you remove the Stocks.

Prune off yet also superfluous branches, and shoots of this second Spring; but be careful not to expose the fruit, without leaves sufficient to screen it from the Sun; furnishing, and nailing up what you will spare to cover the defects of your Walls. Continue yet to cleanse your Vines from exuberant branches that too much hinder the Sun.

Full up the Suckers.

Cut Roses now done bearing.

Sow Radishes, especially the black, to prevent running up to seed, pale tender Cabbages, Cauliflower for Winter-Plants, Corn-fallet, Marygold, Lettuce, Carrots, Parsneps, Turneps, Spinage, Onions; also cut'd Endive, Angelica, Scummary-grass, &c.

Likewise now pull up ripe Onions and Garlic, &c.

Towards the end sow Parsnaps, Chard-beet, Cherrie, &c.

Transplant such Lettuce as you will have abide all Winter.

Gather your Olitory-seeds, and clip, and cut all such Herbs and Plants within one handful of the ground before the fall. Lastly,

Unbind, and release the Buds you inoculated if taken, &c. likewise stop, and prune them.

Now vindemiate, and take your Bees towards the expiration of this Month; unless you see cause (by reason of the Weather and Season) to defer it till mid-September: But if your Stocks be very light and weak, begin the earlier.

Make your Summer Perry, and Cider. See Discourse of Cider, at the end of Pomona.

Fruits in Prime, and yet lasting.

Apples.

The Ladies Longing, the Kirkham Apple, John Apple; the Seaming Apple, Cushion Apple, Spicing, May-flower, Sheep's snout.

Pears.

Windsor, Sovereign, Orange, Bergamot, Slipper Pear, Red Catherine, King Catherine, Denny Pear, Prussia Pear, Summer Peppering, Sugar Pear, Lording Pear, &c.

Peaches.

Roman Peach, Man Peach, Quince Peach, Rambouillet, Musk Peach, Grand-Caration, Portugal Peach, Crown Peach, Bourdeaux Peach, Lavar Peach, the Peach Des pot, Savoy Malacoon, which lasts till Michaelmas.

Nectarines.

The Marcy Nectarine, Tawny, Red Roman, little Green Nectarine, Cluster Nectarine, Yellow Nectarine.

Plums.

Imperial Blue, White Date, Yellow Pear-plum, Black Pear-plum, White Nutmeg, late Pear-plum, Great Anthony, Turkey Plum, the Jane Plum.

Other Fruit.

Cluster-grape, Muscadine, Corinth, Cornelians, Mulberries, Figs, Filberts, Melons, &c.

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Sun { rises-04^h.43^m } **AUGUST** { Hath Days } long 14^h.33^m
 { sets-07^h.17^m } { xxxi. }

To be done

In the Parterre, and Flower-Garden.

Now (and not till now, if you expect success) is the just Season for the budding of the Orange Tree: Inoculate therefore at the commencement of this Month: To have Buds most excellent, cut off the head of some very old Orange tree, which making large shoots, will furnish the best Buds for this work.

Now likewise take up your bulbous roots, or you may sow their seeds, as also those of Lark-beet, Candy-tuft, Columbine, Iron-colour'd Fox-gloves, Holly-hock, and such Plants as endure Winter, and the approaching Seasons.

Plant some Anemone roots to have Flowers all Winter, if the roots escape; and take up your seedlings of last year, which now transplant for bearing: also plant *Dens caninus*, Autumnal Crocus, and *Colchicum*: Note, that English Saffron may be suffered to stand for increase to the third or fourth year without removing.

You may now sow *Narcissus*, and Oriental *Jasmin*, and re-plant such as will not do well out of the Earth, as *Fritillaria*, *Hyacinthus*, *Martagon*, *Dens caninus*, *Lilium*.

Gilly-flowers may yet be sown.

Continue your taking up of bulbs, dry them, and lay them up: *Lilium*, &c. of which before.

Gather from day to day your *Astragalus* seed as it grows black and ripe, and spread it so.

sweat, and dry before you put it up; therefore move it sometimes with a broom, that the seeds clog not together, unless you will separate it from the Mucilage, for then you must a little bruise it wet; wash and dry them in a cloth.

Water well your Balsamum fern.

Most other Seeds may now likewise be gathered from shrubs, which you find ripe.

About mid-August, transplant *Auricula*'s, dividing old, and luffy roots; also prick out your Seedlings: They best like a loamy sand, or light moist Earth; yet rich, and shaded: You may likewise sow *Auricula*.

Now, towards the latter end, you may sow Anemone seeds, *Ranunculus*, &c. lightly cover'd with fit mould in Cists, shaded and frequently water'd: Also *Cyclamen*, *Jasmin*, *Iris*, *Hepatica*, *Primrose*, *Fritillaria*, *Martagon*, *Fraxinella*, *Tulips*, &c. but with patience for some of them; because they flower not till three, four, five, six, and seven years after, especially the *Tulips*; therefore disturb not their beds, but hand-water them, and let them be under some warm place, shaded yet, till the heats are past, lest the seeds dry; only the *Hepatica*'s, and *Primroses* may be sow'd in some less expos'd beds.

Now, about Bartholomew-tide, is the only season for removing, and laying your perennial Greens; *Oranges*, *Lemon*'s, *Myrtles*, *Phillyreas*, *Oleanders*, *Jasmin*'s, *Arbutus*, and other rare Shrubs, as *Pomegranate*, *Monthly Rose*, and whatever is most obnoxious to frost; taking the shoots, and branches of the past Spring, and pegging them down in very rich earth and soil perfectly consumed, covering them upon all occasions during the Summer; and by this time twelve months they will be ready to remove. Transplant in fit earth, set in the shade, and keep moderately moist, not over wet, left the young fibres rot; after three weeks set them in some more airy place, but not in the Sun, till fifteen days more; Vide our Observations in April, and May, for the rest of these choice Directions.

Flowers in Prime, or yet lasting.

Amaranthus, Anagallis Lufitanica, Alter Atticus, Blatteria, Spanish hills, Bidivider, Cardations, Campanula, Clematis, Cyclamen Peruanum, Datura Turcica, Echiochrysa, Eryngium platanum, Amelbylinum, Geranium creticum, and Triste, Yellow Stocks, Hieracium minus Alpitric, Tiberis, Hyacinth, Linonum, Litaria cretica, Lycnis, Mirabilis Peruviana, Yellow Mistletoe, Nasturtium, Yellow mountain, Harts-tongue, Maracoe, Africanus fox, Convolvulus's Scabrous, Asphodelis, Delphinium, Lupinus, Colchicum, Lucum, Autumnal Hyacinth, Holly-hock, Star-wort, Thlaspiot, French Mary-gold, Daffies, Geranium nobile olens, Common Pansies, Lark-beet of all colours, Nigella, Hillborns, Balsamin. Jam. Lobelia catch-fly, Thlaspi creticum, Rosemary, Musk-Rose, Monthly Rose, Oleanders, Spanish Jasmin, Yellow Indian Jasmin, Myrtles, Oranges, Pomegranate double, and single flowers, Shrub Spices, Agnus castus, the Virginian Martagon, Malva arborescens, &c.

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Sun { rises 05^h 41^m } SEPTEMBER { Hath days } long 12^h 37^m
 { sets 06--19 } { xxx. }

To be done

In the Orchard, and Olitory-Garden.

Gather now (if ripe) your *Winter Fruits*, as *Apples*, *Pears*, *Plums*, &c. to prevent their *falling* by the great *Winds*: *Alfo* gather your *Wind-falls* from day to day: do this work in dry weather.

Release Inoculated *Buds*, or sooner, if they pinch.

Sow *Lettuce*, *Radish*, *Spinage*, *Parfnep*, *Skirrets*, &c. *Caully-flowers*, *Cabbages*, *Onions*, &c. *Scurvy-graft*, *Amifeds*, &c.

Now may you *Transplant* most sorts of *Eſculent*, or *Physical* Plants, &c.

Alſo *Artichocks*, and *Asparagus-roots*. See *Diſc.* of *Earth*, p. 322. Sow alſo *Winter-Herbs* and *Roots*, and plant *ſtraw-berries* out of the *Woods*.

Towards the end, Earth up your *Winter plants*, and *ſallad herbs*; and plant forth your *Caully-flowers*, and *Cabbages* which were ſown in *Auguſt*. Prepare *Compoſt*, ſee *January*: To trench and prepare earth, ſee *Diſc.* of *Earth*, p. 299.

No longer now defer the taking of your *Bees*, ſtraightning the entrances of ſuch *Hives* as you leave to a ſmall *paſſage*, and continue ſtill your *hoſtility* againſt *Waſps*, and other robbing *Inſects*.

Cider-making continues.

Fruits in Prime, or yet laſting.

Apples.

The *Belle-bonne*, the *William*, Summer *Pearmain*, *Lording-apple*, *Pear-apple*, *Quince-apple*, *Red-greening ribb'd*, *Bloody-Pepin*, *Harvey*, *Violet-apple*, &c.

Pears.

Hamdens Bergamot (firſt ripe) Summer *Bon Chreſtien*, *Normich*, *Black Worceſter*, (baking) *Green-field*, *Orange*, *Bergamot*, the *Queen hedge-pear*, *Lewei-pear* (to dry excellent) *Frith-pear*, *Arundel-pear*, (alſo to bake) *Brunſwick-pear*, *Winter Poppering*, *Bings-pear*, (baking) *Diego*, *Emperours-pear*, *Bluſter-pear*, *Meffire Jean*, *Rowling-pear*, *Balfon-pear*, *Bezy d' Hery*, &c.

Peaches, &c.

Malacoton, and ſome others, if the year prove backwards, *Almonds*, &c.

Quinces.

Little Blue-grape, *Muscadine-grape*, *Frontiniac*, *Parſley*, great *Blue-grape*, the *Verjuice-grape* excellent for ſauce, &c.

Berberries, &c.

Sun { rises 05^h 41^m } SEPTEMBER { Hath Days } long 12^h 37^m
 { sets 06-19 } { xxx. }

To be done

In the Parterre, and Flower-Garden.

Plant ſome of all the ſorts of *Anemones* in good, rich natural earth, eſpecially the *Letifol*, after the firſt *Rains*, if you will have *flowers* very forwards; but it is ſurer to ſtand till *October*, or the Month after, left the over *moſture* of the Autumnal ſeaſon give you cauſe to repent. Now is the moſt proper ſeaſon to ſow *Auricula ſeeds*, ſetting the *Cuts* in the Sun till *April*: See *April*.

Begin now alſo to plant ſome *Tulips*, unleſs you will ſtay till the later end of *October*, to prevent all hazard of raiſing the *Bulbs*. Plant *Daffodils*, and *Colchicum*.

All *Filicet* Plants, ſuch as *Hepatica*, *Hellebor*, *Campanula*, &c. Alſo the *Capillaris*, *Matricaria*, *Viola*, *Primroſe*, &c. may now be tranſplanted; as likewiſe *Iris-cholodon*, *Cyclamen*, &c.

Now you may alſo continue to ſow *Alstræa*, *Phloxæ*, (or you may forbear till the Spring) *Iris*, *Crown Imperial*, *Matagon*, *Tulip*, *Delphinium*, *Nigella*, *Candy-tuſt*, *Poppy*; and generally all the *Annals* which are not impair'd by the Froſts.

Sow *Primroſes* likewiſe: Remove ſeedling *Digitalis*, and plant the ſlips of *Lychnis* at the beginning.

Your *Tuberſes* will not endure the wet of this *ſeaſon*, therefore ſet the *Pots* into your *conſerve*, and keep them very dry; It is beſt to take them out of the *Pots*, about the beginning of this Month, and either to preſerve them in *dry ſand*, or to wrap them up in *Paper*, and ſo put them in a box near the Chimney.

Bind now up your *Autumnal Flowers*, and *Plants* to ſtaks, to prevent ſudden *Gaiſts* which will ſtill proſtriate all you have to indolently rain'd.

Now you may take off *Gilly-flower-layers* with earth and all, and plant them in *Pots*, or borders ſhaded.

Crocus will be now rain'd of *ſeeds*.

Prune Plants, and *Firs* a little after this *Equinox*, if you omitted it in *March* (which is much the better ſeaſon) Vile *March*.

About *Michaelmas* (ſooner, or later, as the *ſeaſon* directs) the weather fair, and by no means ſoggy, retire your choice *Ornents*, and rareſt *Plants* (being dry) as *Oranges*, *Lemons*, *Indian*, and *Span*. *Jasmines*, *Oleanders*, *Barba-Jovis*, *Anemum* *Plum*, *Citrus* *Lunatus*, *Chamaelæa*, *Tricoccos*, *Cliffus*, *Leden* *Cluſii*, *Dittus*, *Alons*, *Sidam's*, &c. into your *conſervatory*; ordering them with ſtrech ſold, as you were taught in *May* and *July*, &c. taking away ſome of the upmoſt *exhauleſt* earth, and ſtirring up the reſt, fill the *Cuts* with *ſand*, and well *conſured ſoil*, to waſh in, and nourish the *Roots* during *Winter*; but as yet leaving the *doors* and *windows* open, and giving them much *Air*, ſo the *winds* be not ſharp and high, nor weather foggy; ſo thus till the cold being more inſenſible, adviſe you to enliſt them altogether: *Myrtils* will endure abroad near a Month longer.

The cold now advancing, ſet ſuch *Plants* as will not endure the *Hoſts*, into the earth; the *Pots* two or three inches lower than the ſurface of ſome bed under *Southern* expoſure: Then cover them with *glaiſs*, having cloſe'd them firſt with ſweet, and dry *Maſs*; but upon all warm, and benign *emiſſions* of the Sun, and ſweet *ſhowers*, giving them *air*, by taking off all the covers them: Thus you ſhall preſerve your *ſeeds*, and precious *Marum-Syriacum*, *Ciſtus*, *Grazian* *moſt* *alons*, *Flus* *cardinalis*, *Morane*, ſeedling *Arbutus* (a very hardy Plant when greater) choic'eſt *Ranunculus*; and *Anemones*, *Acacia* *Egypt*, &c. Thus governing them till *April*. *Secrecies* not till now divulg'd.

Note, That *Cats* will eat, and deſtroy your *Marum-Syriacum* if they can come at it, therefore guard it with a *Fox*, or *Holly-branch*.

Flowers in Prime, or yet Laſting.

A *Maranthus* *tricolor*, and others; *Anagallis* of Portugal, *Antirrhinum*, *African* ſo. *Apocynum* *Plum*, *Aſtr* *Atticus*; *Belpheore*, *Bellis*, *Campanula*, *Colchicum*, *Autumnal* *Cyclamen*, *Clematis*, *Cloſanthemum* *angoliſol*. *Eupatorium* of Canada, *Sue* *flower*, *Stock-gil*, ſo. *Gravatum* *Criticum*, and *noſte* *olens*, *Gentiana* *annual*, *Hieracium* *minus* *Alpeſtre*, *Tuberos* *Indian*, *Taxifol*, *Leonia* *Critica*, *Lychnis* *conſtant*, *ſingle* and *double*; *Limonium*, *Indian* *Lilly*, *Narciff*, *Pomum* *arbutifolius*, *Indian* *Pink*, *Chiaſmifol* *Apples*, *Ciſſium* *Ind*, *Gilly-flowers*, *Palſon-flowers*, *Dart* *double* and *ſingle*, *Portugal* *Ranunculus*; *Spaniſh* *Jasmin*, yellow *Virginian* *Jasmin*, *Rhododendron* white and red, *Oranges*, *Myrtils*, *Balanſia*, *Maſk-Roſe*, and *Monthly-Roſe*, &c.

m

Sun { rises 06^h.36^m } OCTOBER { Hath days } long 10^h 47^m
 { sets 05^h.24^m } { xxxi. }

To be done

In the Orchard, and Olitory-Garden.

Trench Grounds for Orcharding, and the Kitchen-Garden, to lie for a Winter mellowing. See Discourse of Earth, p. 298. &c.

Plant dry Trees (i.) Fruit of all sorts, Standard, Mural, or Shrubs which lose their leaf; and that so soon as it falls: but be sure you chuse no Trees for the Wall of above two years Grassing at the moil, sound and smooth. See Disc. of Earth, p. 321. and Pomona, c. 6.

Now is the time for Ablaqueation, and laying bare the Roots of old unthriving, or over hasty-blooming trees. Stir up new planted grounds as directed in March.

Moon now decreasing, gather Winter-fruit that remains, weather dry; take heed of bruising, lay them up clean lest they taint; Cut and prune Roses yearly, reducing them to a Standard not over tall: to prevent bruising by wind-fall, lay some straw under the Trees.

Plant, and Plath Quick-jets.

Remove Grass after the second year, unless Dwarfs, which you may let stand till the third.

Save, and sow all stony, and hard kernels and seeds; such as black Cherry, Morellos, black Heart, all good; Pear-plum, Peach, Almond-stones, &c. Also Nuts, Haws, Ashen, Sycomor, and Maple keys; Acorns, Beech-mast, Apple, Pear, and Crab kernels, for Stocks; or you may defer it till the next Month towards the latter end, keeping them dry, and free from mustiness; remembering to cover the beds with litter: See directions in Sylva; for Forest-Trees, Pomona, cap. 1.

You may yet sow Genoa Lettuce which will last all the Winter, Reddish, &c.

Make Winter Cider, and Perry.

Towards the later end plant Abricots, Cherries, Plums, Vines, Winter-pears, &c.

Fruits in Prime, or yet lasting.

Apples.

Belle-et-Bonne, William, Costard, Lording, Parsley apples, Pear-maine, Pear-apple, Honey-meal, Apis, &c.

Pears.

The Cam-pear, (baking) Green-butter-pear, Thorn-pear, Clove-pear, Rosset-pear, Lombard-pear, Russet-pear, Saffron-pear, and some of the former Month, Violet-pear, Petworth-pear otherwise call'd the Winter Windsor.

Bullis, and divers of the September Plums and Grapes, Pines, Arbutus, &c.

m

Sun { rises 06^h.36^m } OCTOBER { Hath Days } long 10^h 47^m
 { sets 05^h.24^m } { xxxi. }

To be done

In the Parterre, and Flower-Garden.

Now your Hyacinthus Tuberosa not enduring the wet, must be set into the house, and preserved very dry till April. See September.

Continue sowing what you did in September if you please: Like-wise Cypress may be sown, but take heed of the Frost; therefore forbear the clipping of them: vide March Also.

You may plant some Anemonies, especially the Tenaisolia's and Ranunculus's, in fresh sandish earth, taken from under the turf, but lay richer mould at the bottom of the bed, which the fibres may reach; but not touch the main roots, which are to be covered with the natural earth two inches deep; and so soon as they appear, secure them with mats; or dry straw, from the winds and frosts, giving them air in all benign intervals, if possible once a day.

Plant also Ranunculus's of Tripoly, Vernal Crocus, &c. Remove seedling Holy-hocs, or others.

Plant now your choice Tulips, &c. which you feared to sow at the beginning of September; they will be more secure, and forward enough: but plant them in natural earth somewhat impoverished with very fine sand; else they will soon lose their variegations; some more rich earth may lie at the bottom, within reach of the fibres (as above): Now have a care your Carnations catch not too much wet; therefore retire them to covert, where they may be kept from the rain, not the air, or lay them on the sides; trimming them with fresh mold.

All sorts of Bulbous roots may now also be safely buried; likewise Iris's, &c. See Disc. of Earth, p. 323, 324. proper mold for Flowers.

You may yet sow Alaternus, and Phillyrea seeds: It will now be good to Beat, Roll, and Mow Carpet-walks, and Camomiles; for now the ground is supple, and it will even all inequalities: Finish your last Weeding, &c.

Sweep, and cleanse your Walks, and all other places from Autumnal leaves fallen, lest the Worms draw them into their holes, and foul your Gardens, &c.

Flowers in Prime, or yet lasting.

A Maranthus tricolor, &c. After Atticus, Anomum, Antirrhinum, Colchicum, Saffron, Cyclamen, Clematis, Heliotropis, Stock-gilly-fls. Geranium irise, Ind. Tuberosa Jacynth, Limonium, Lychnis white and double, Pomum Amoris and Ethiop. Marcel of Peru, Millefol. Intenn, Autumnal Narciss. Pansies, Aleppo Narciss. Spherical Narciss. Nasturt. Persicum, Gilly fls. Virgin. Phalangium, Pilosella, Violets, Veronica, Arbutus, Span. Jasmine, and yellow Ind. Jasmine, Monthly Rose, Oranges, Myrtles, Balaufl. or Pomegranade.

2

Sun { rises 07^h 34^m } NOVEMBER { Hath days } long 08^h 52^m
 { sets 04--26 } xxx.

To be done

In the Orchard, and Olitory-Garden.

Carry Compost out of your Melon-ground, or turn, and mingle it with the earth, and lay it in Ridges ready for the Spring; Also trench, and fit grounds for Artichocks, &c. See Disc. of Earth, p. 322.

Continue your Setting, and Transplanting of Trees; lose no time, hard Frosts come on apace: See Disc. of Earth, p. 323. Yet you may lay bare old roots.

Plant young Trees, Standards, or Mwal. See Disc. of Earth, p. 321, 322.

Furnish your Nursery with stocks to graft on the following year.

Sow, and set early Beans, and Pease till Shrove-tide; and now lay up in your Cellars for spending, and for Seed, to be transplanted at Spring, Carrots, Parsneps, Turneps, Cabbages, Caully-flowers, &c.

Cut off the tops of Asparagus, and cover it with long-dung, or make Beds to plant in Spring, &c.

Now, in a dry day, gather your last Orchard-fruits.

Take up your Potatoes for Winter spending, there will enough remain for stock, though never so exactly gather'd.

Fruits in Prime, or yet lasting.

Apples.

The Belle-bonne, the William, Summer Pearmain, Lording-apple, Pear-apple, Cardinal, Winter Chess-nut, Short-stark, &c. and some others of the former two last Months, &c.

Pears.

Messire Jean, Lord-pear, long Bergamot, Warden (to bake) Burnt-Cat, Sugar-pear, Lady-pear, Ice-pear, Dove-pear, Deadmans-pear, Winter Bergamot, Bell-pear, &c.

Arbutus, Bulbs, Medlars, Services.

2

Sun { rises 07^h 34^m } NOVEMBER { Hath days } long 08^h 52^m
 { sets 04--26 } xxx.

To be done

In the Parterre, and Flower-Garden.

Sow Auricula seeds thus; prepare very rich earth, more than half dung, upon that sift some very light sandy mold, and the earth gotten out of old hollow Willow-trees; and then sow: set your Cases or Pans in the Sun till March, or April.

Cover your peeping Ranunculus's, &c. And see the Advice in March, for Ever-green Seedlings; especially, if long Snows, and bitter winds be feared.

Now is your best season (the weather open) to plant your fairest Tulips in places of shelter, and under Espaliers; but let not your earth be too rich; vide October. Transplant ordinary Jasmine, &c.

About the middle of this Month (or sooner, if weather require) quite enclose your tender Plants, and perennial Greens, Shrubs, &c. in your Conservatory, including all entrance of cold, and especially sharp winds; and if the Plants become exceeding dry, and that it do not actually freeze, refresh them sparingly with qualified water, (i.) mingled with a little Sheep, or Cow-dung: If the season prove exceeding piercing (which you may know by the freezing of a dish of water, or moistned Cloth, set for that purpose in your Green-house) kindle some Charcoals, and when they have done smoking, put them in a hole sunk a little into the floor about the middle of it: This is the safest Stove: At all other times, when the air is warm'd by the beams of a fine day, and that the Sun darts full upon the house, without the least wind stirring, shew them the light through the glass windows, but enclose them again before the Sun be gone off: Note, That you must never give your Aloes, or Sedums one drop of water during the whole Winter: And indeed, you can hardly be too sparing of Water to your house-plants; the not observing of this, destroys more Plants than all the rudenesses of the Season: To know when they want refreshing, consider the leaves; if they shrivel and fold up, give them drink; if pale, and whitish, they have already too much; and the defect is at the roots, which are in peril of rotting; and note this for a rule, that you are not much to regard the surface mold, for that will often be dust, when the earth about the roots is moist enough: Search it therefore with your hand, and as you find occasion, govern the water; for on this secret of seasonably refreshing, consists the health and life of your choicest house'd curiosities. If your Aloes grow manifestly too dry, expose it a while to the air, when clear, 'twill immediately recover them; but give them not a drop of water how dry so ever their pots be.

House your choicest Carnations, or rather set them under a Pent-house against a South-wall, so as a Covering being thrown over them to preserve them in extremity of weather, they may yet enjoy the freer air at all other times.

Prepare also Mattresses, Boxes, Cases, Pots, &c. for shelter to your tender Plants and Seedlings newly sown, if the weather prove very bitter.

Plant Roses, Althea frutes, Lilac, Syringas, Cypris, Peonies, &c.

Plant also Fibrous roots, specified in the precedent Month.

Sow also stony seeds mentioned in October.

Plant all Forest-trees for Walks, Avenues, and Groves. See Sylva.

Sweep and cleanse your Garden-walks, and all other places, from Animal leaves, the last time.

Flowers in Prime, or yet lasting.

A Nemones, Meadow Saffron, Antirrhinum, Stock-gilly-fls, Bellis, Clematis, Pansies, some Carnations, double Violets, Petonica, Spanish and Indian Jasmine, Myrtles, Musk-Rose, &c.

Sun { rises 08^h. 10^m } DECEMBER { Hath days }
 { sets 03. 50 } { xxxi. } { long 07^h 40^m }

To be done

In the Orchard, and Olitory-Garden.

PRune, and Nail Wall-fruit, (which yet you may defer a Month or two longer) and Standard-trees.

You may now plant Vines, &c. See Disc. of Earth, p. 322.

Also Stocks for Grafting, &c.

Sow as yet, Pomace of Cider-pressings to raise Nurseries; and set all sorts of Kernel, Stones, &c.

Sow for early Beans, and Peas, but take heed of the Frosts; therefore surest to defer it till after Christmas, unless the Winter promise very moderate.

All this Month you may continue to Trench Ground, and dung it, to be ready for Bordures, or the planting of Fruit-trees, &c. See the Note in January.

Either late in this Month, or in January, prune, and cut off all your Vine shoots to the very root, save one, or two of the stoutest, to be left with three, or four eyes of young wood: This, for the Vineyard.

Now feed your weak Stocks.

Turn, and refresh your Autumnal Fruit, left it taint, and open the Windows where it lies, in a clear and serene day.

Fruits in Prime, and yet lasting.

Apples.

Rousseting, Pepin, Leather-coat, Winter Reed, Chest-nut-Apple, Great-belly, the Go-no-further, or Cats-head, with some of the precedent Month.

Pears.

The Squib-pear, Spindle-pear, Doyoniere, Virgin, Gasconne-Bergamot, Scarlet-pear, Stoppie-pear, White, red, and French Wardens (to bake or roast) &c. the Dead-mans pear, excellent, &c.

Sun { rises 08^h. 10^m } DECEMBER { Hath days }
 { sets 03. 50 } { xxxi. } { long 07^h 40^m }

To be done

In the Parterre, and Flower-Garden.

AS in January, continue your hostility against Vermine.

Preserve from too much Rain and Frost, your choicest Anemonies, Ranunculus's, Carnations, &c.

Be careful now to keep the Doors and Windows of your Conservatories well matted, and guarded from the piercing Air: for your Oranges, &c. are now put to the test: Temper the cold with a few Charcoal govern'd as directed in November; but never accustom your Plants to it, unless the utmost severity of the Season require; therefore, if the place be exquisitely close, they will even then hardly require it, &c.

Set Bay-berries, &c. dropping ripe.

Look to your Fountain-pipes, and cover them with fresh, and warm Littier out of the Stable, a good thickness, lest the frosts crack them; remember it in time, and the Advice will save you both trouble and charge.

Flowers in Prime, and yet lasting.

ANemonies some, Persian, and Common winter Cyclamen, Antirrhinum, Mezereon, Black Hellebor, Lanthusinnus, single Primrose, Stock-gilly-fls. Iris Clusii, Snow flowers or drops, Tulce, &c.

For by such a *Kalendar* it is that a *Royal Garden* or *Plantation* may be contrived, according to my Lord *Vernham's* design, *pro singulis Anni Mensibus*, for every *Month* of the *Year*.

But, because it is in this *cold Season*, that our *Gard'ner* is chiefly diligent about preserving his more *tender, rare, exotic, and costly Shrubs, Plants, and Flowers*; We have thought fit to add the *Catalogue*, as it is (much after this sort) collected to our hands, by the *Learned* and *Industrious Doctor Sharrock* (though with some *reformation and improvement*) of all such, as according to their different *Natures*, do require *more, or less* indulgence: And these we have distributed likewise, into the *three* following *Classes*.

I. CLASSE.

Being least patient of *Cold*; and therefore to be first set into the *Conservatory*, or other ways defended.

A *Cacia Egyptiaca*, *Aloe American*. *Amaranthus tricolor*, *Aspalathus Cret.* *Balsamum*, *Helicryson*, *Chamelea tricolor*, *Nasturtium Indicum*, *Indian Narcissus*, *Ornithogalon Arab.* *Ind.* *Phaseol. Capsicum Ind.* *Pomum Ethiop.* *Aurcum*, *Spinosum*, *Summer Sweet Majoran*, the two *Marums Syriac.* &c. *Dactyls*, *Pistacio's*, the great *Indian Fig*, *Lavendula Multif.* *Clus.* *Cistus Ragusens* *flo. alb.* *Colutea Odorata Cretica*, *Narcissus Tuberosus*, *Styrax Arbor*, &c.

II. CLASSE.

Enduring the second degree of *Cold*, and accordingly to be secur'd in the *Conservatory*.

A *Momum Plinii*, *Carob*, *Chamelea Alpestris*, *Cistus Ledon* *Clus.* *Citron*, *Vernal Cyclamen*, *Summer Purple Cyclamen*, *Digitalis Hispan.* *Geranium trifide*, *Hedysarum Clypeatum*, *Aspalathus Creticus*, *Span.* *Jasmine*, *Virgin.* *Jasmine*, *Suza Iris*, *Jacobea Marina*, *Alexandrian Laurel*, *Oleanders*, *Limonium elegans*, *Myrtile*, *Oranger*, *Lentiscus*, *Levantine tufted Narcissus*, *Gill.* *flo.* and choicest *Carnations*, *Pbalangium Creticum*, *Asiatic double* and single *Ranunculus's*, *Narcissus* of *Japan*, *Cytisus rubra*, *Canna Indica*, *Thymus Capitatus*, *Verbena nodi* *flo. Cretica*, &c.

III. CLASSE.

III. CLASSE.

Which not perishing but in excessive *Colds*, are therefore to be left set in; or rather protected under *Mattraffes*, and slighter *Coverings*, abroad in the *Earth*, *Cases*, *Boxes*, or *Pots*, &c.

A *Brotanum mas*, *sem.* *Winter Aconite*, *Adiantum Verum*, *Bel-lis Hispan.* *Calceolus Marie*, *Capparis*, *Cineraria*, *Cneorum Matthioli*, *Cytisus Marantha*, *rub.* *Lunatus*, *Eryngium planum totum Caruleum*, *Fritillaria mont.* *Genista Hispan.* *flo. alb.* *Pomegranads*, *Oriental Jacynth*, *Bulbous Iris*, *Laurels*, *Cherry Laurel*, *Lychnis* double white, *Matricaria* double *flo.* *Olive*, *Pancration*, *Papaver spinosiss.* *Maracoe*, *Rosemary*, *Sisyrinchium*, *Turpentine-tree*, *Teucrium mas*, *Tithymal*, *Myrtifol.* *Vetonica* doub. *flo.* single *Violets*, *Serpentaria trifol.* &c. *Ornithogalon Arab.* white and doub. *Narcissus* of *Constantinople*, late *Pine-apples*, *Moly*, *Persian Jasmine*, *Opuntia*, or the smaller *Indian Fig*, *Jucca*, *Sejeli Ethiop.* *Agnes Castus*, *Malva Arborefcens*, *Cistus mas*, *Sarsaparilla*, *Cupressus*, *Cribrum marinum*, &c.

And to these might some others be added; but we conceive them sufficient, and more than (we fear) some envious, and mercenary *Gard'ners* will thank us for; but they deserve not the name of that *Communicative*, and noble *Profession*: However, this, as a *Specimen* of our *Affection* to the *Publick*; and in *Commiseration* of divers honourable, and *Industrious Persons*, whose *Inclination* to this innocent *Toil*, has made them spare no *Treasure*, or *Pains* for the furniture of their *Parterres* with variety, the *misfortune* whereof being sometime *universal* to the *Curious*, has made us the more freely to impart both what we have experimentally learn'd by our own *Observations*, and from others of undoubted *Candor* and *Ingenuity*: But of this, we promise a more ample *Illustration*, as it concerns the entire *Art*, together with all its *Ornaments* of *Use*, and *Magnificence*, as these endeavours of ours shall find *entertainment*, and *opportunity* contribute to a *Design*, which I confess I have formerly oblig'd my self to publish; but as it has been now long under my hand, so daily increasing in bulk, with fresh, and material observations, it will require a more accurate *Transcript* for the *Press*, and better *leisure* than as yet I can obtain to perfect that *absolute work* as I think I may without immodesty term it, compar'd with any on that subject to this day Extant.

Now so far as there are divers *Gentlemen*, and *Persons* of Honour inquisitive after *Catalogues* of the more choice, and rarer *Fruits*, I have thought good (*ex abundanti*) to annex the following *Tables*, as I find them approv'd of in the best *Plantations* and *Ortyards*, as well as *Authors*.

For

For those who affect to have their Fruit out of France:

Apples.

Passe Pomme blanche batifue, Passe pomme Cotelée, Calville d'Esté, Rambour blanc, Rambour rouge, Cousinette, Pomme de Violette, Pomme de neige, Calleville blanc, Calleville rouge, Pomme d'Apiß, Renette blanche, Meilleur Renette rousse, Renette toute grize, petit Courpendu gris, Courpendu Vermeil, Gros Courpendu Bedeau, Franeatu, Pomme-poire, Chataigner, &c.

Pears.

June.

Petit Muscat. D. S. Petit certain d'Esté. D. W. Janet. D. W. Pucelle or Palme.

July.

Gros Muscat ordinaire. S. Muscat a longue queue. S. Muzelle. S. Gros Muscat, Ou, Belissime. S. Muscat Robert. S. Cuisse Madame. S. W. Roussel batif. S. W.

August.

Orange commune. S. D. W. Orange Musquée. S. D. W. Amiral. S. D. W. Amiral Musquée. S. D. W. Grosse Blanquette, or poir de Perle, or Cornicape. S. D. W. Oignonnet. S. D. W. Poire de Prince, Poire Royale, Poire à deux têtes, all S. D. W. Poire raze. W. D. Pin, ou batif. S. D. W. Poire Curmesine. S. D. W. Friolet, Mouille-bouche d'Esté, Bon-Chrestien d'Esté, Franc-Sureau, or Poire de Papas, all in S. D. or W.

September.

Roussel ordinaire, Gros Roussel de Rheims, Jargonelle. S. D. W. Caillau Rozart. S. Persim. S. D. W. P. sans pepins. P. de Sain. S. D. W.

October.

Beuré rouge. Beuré blanc. S. D. W. Rozar d'Ingrande. D. W. Bergamotte d'Esté, W. Oignon Rozar, or Brutte-bonne. W. D. Poire d'Angleterre. S. D. W. P. d'Amber-gris. D. W. P. de Vigne. S. D. W. Petit Oing-gris, Chat-Brulé. S. D. W.

November.

Messire Jean Ordinaire, M. Jean blanc. Bezidberry, Dama-dote, Grosse queue d'Hyver. S. D. W. Bergamotte ordinaire. W. Martin sec. S. D. W. Bergamotte Musqué or P. de Sicile. D. W.

December, to eat Raw.

Micet. W. Poire Figue. S. D. W. Roussel d'Hyver. S. D. W. Bon-Chrestien d'Anche Cottelée. W. B. Chrestien rond. B. Chr. long. B. Chr. doré sans pepin. W. P. de Froment. S.

To Bake.

Fin Or, or Franc-real. S. D. Dame Jeanne. Bon Eveque, Foulon. S. D.

January, to eat Raw.

Gratellier or Beuré d'Hyver. S. D. W. Bergamotte d'Hyver. Orange d'Hyver. S. D. W. all the Bon Chrestiens.

To

To Bake.

Poire d'Argent, S. Rateau, Harpiene, Angobert or Languedoc, Gros Certain. S.

February, to eat Raw.

Saint bezin. W. St. Lézin Beuré. W. Messire Jean hardif. D. W. B. Chrestien.

To Bake.

Petit Certain. S. D. de la Domoille. S. March, to eat Raw.

Portail. W. Gros Muscat d'Hyver a grosse queue. D. W.

To Bake.

Poire de Liore. S.

April, to eat Raw.

Bergamotte de Bengi. W. D. Poire d'Estrangillon. W. D. Virgoulette. W. D.

To Bake.

Liquet rond. S. Parmain, Bouwart or Chesne Galen. S.

May, to eat Raw.

Double Fleur. D. W. Fontarabie. W.

To Bake.

Girofle.

Cherries.

Cerises precoces, C. Hatifi, C. à feuille de sauge, Grosse C. à court queue, C. tardifs à longue queue. Guigne, Bigarreau, Griote. W. S.

Abricots.

Ab. Musqué.

Plums, to eat Raw.

Petit Damas noir de Tours, Gros Damas noir, Petit Damas blanc, Gros Damas blanc, Damas Gris Musqué, Damas violet ordinaire, Gros Damas Violet, Damas Verd, Damas gris violet, Damas gris blanc, Perdrigon blanc. W. Perdrigon violet. W. Brignolles Violettes, Grosse Imperiale, Imp. tardife. De Guillon, d'Attilles de Gouvar, d'Attilles du Mani, Prunes de Naples, or Damas gris de Caiban. D. S.

To preserve.

Moyens de Bourgogne, Mirabelle, St. Catherine, Diaprée de la Roche Courbon, Prunes d'Abricot de Tours, Mirabons transparents, Montmirol, d'Attille Jaune, l'Isle verd. D. S.

Peaches.

Avant Pêche blanc, Pavie. Avant P. d'Italie. Pêche de Troix blanche, P. de Troix jaune, fort musquée. P. de Troix double. Al. berge. Pêche Magdeleine. P. blanche batifue. Pavie blanc batif. P. Cerize, P. Violette licée, Brignon Violet, or Musqué, Pavie. Brignon jaun. Pêche Royale, Grosse Roussane, Petite Roussane, Gros Pavies jaunes, &c. rouges Persiques, Pêches de Pan, or Persiques ronds, Grosse Pêches jaunes, P. Bourdes. P. Abrigotines, P. Ollieres, Pêches de Corbiel. P. blanches, & Vermeilles, P. de Narbonne, & P. admirables. Pavie admirable. Pêche violette tardive, Pavie de Chinon, Brignon violette tardive, Melles-cotons

cotons vermeils, *Pesche blanc & rouge*, *Pavies blancs tardifs*, *Pesche tout blanche*, *P. beste-rave*. *Brignon Beste-rave*, *Brignon tout noir*.

Note, that S.D.W. signifies that they may be planted in *Standard*, *Dwarfs*, or at the *Wall*, and these are the most curious, and researched sorts of *Fruit-trees*, which are to be procur'd about *Paris*, but of which we have many amongst the well furnish'd Plantations of *Gentlemen* both near the *City of London*, and in the *Country*.

Catalogue of *Fruit-trees* to be had out of the *Nurseries* near the *City of London*.

Apples.

Golden Pepin, *Kentish P. Stone P. French P. Russet P. Holland P. Kirton P. Carlisle P. Bridgewater P. Summer pepin*, *Blondy pepin*. *Summer Pearmain Winter Pearmain*, *Russet Pearmain*, *Golden Russeting*, *Green Russet*, *Red Russeting*. *Orange Apple*, *Golden Rennet*, *Lincoln Rennet*, *Leather-coat*, *John Apple*, *Margold*, *Harvey*, *Queen-Paradise*, *Apples*; *Gilliflower*, *Margaret*, *Westberry*, *Golden doucet*, *Pome-water*, *Pome Roy*, *Juniting*, *Claret-wine*, *Giant*, *Famagusta*, *Good-housewife*, *Cats-head*, *Spicing Apple*, *Violet Angels bit*, *Lording*, *Pome Appis*, *Fig Apple*, *Crepper*, *Indian Crab*, *Bell & bon summer* and *winter*, *Pear Apple*.

Cider Apples.

Redstrakes summer, winter, yellow, 1cd, *through strak'd*; *Gen-net Moyle*, white and red *Musf*, *Fox-whelp*, *Bromsbury Crab*; *E-leots Apple*, *Stocken*, *Bitter Scale*, *Deans Apple*, *Pweling*, summer and winter *Filletts*, *Underleaf*, *Grange Apple*, *Olive Apple*, *Quince Apple*, *Non-such*, *Peeling*, *Oken pin*, *Greening*: Amongst the *Sweetings*, the *Hony-comb*, the small *Russet sweet Apple*, *Cod-lings*, &c.

Pears.

Bœvre du Roy, *Greenfield*, *Susan*, *Windfor*, *Bergamots*, *Maudlin*, *Sugar*, *Margarite*, *Madera*, *St. Lawrence*, *Chest*, *Royal*, *Orange*, *Katherine*, *Sovereign*, *Denny*, *Popperings*, *Prussia*, *Bon-Chrestien*, *Lording*, *Hamden*, *Bezi*, *Painted*, *Violet*, *Short-start*, *Dove*, *Musf*, *Bingfield*, *Russet*, *Roussellet*, *Norwich*, *Amadotte*, *Worcester Pomegranate pear*, *Edward*, *Maiden-beart*, *Blondy*, *Lewis*, *Stone*, *Caw*, *Arundel*, *Bishop*. The several *Wardens*, viz. *English*, *Spanish*, *French*, *Roman*, white, green, and *Parkinsons Warden* best of all: To these add the *Diego*, *Messier Jehan*, *Kowlings*, *Balsam*, *Bluster*, *Imperial*, *Queen-hedge*, *Frith*, *Bings*, *Brunswic*, *Thorn*, *Portail*, *Non-such*, *Clove*, *Lombart*, *Russet*, *Petworth*, *Saffron Pound*, *Burnt-Cat*, *Hundred-pound pear*, *Lady*, *Deadmans*, *Bell*, *Ice*, *Virgin*, *Gascoigne*, *Stoppel*, *Scarlet*, *Dojoniere*, *Dionier*, *Spindle*, *Squib*, *Surrein*, *Dagobert*, *Kairville*, *Double blossom*, *Oaken*, *Black Worcester pear*, &c.

For

For Perry.

John Pear, *Drake*, *Lullam*, *Bosbury*, *Bareland*, *Red and Green Squash*, the green *Harpy*, *Mary*, *Horfe-Pears*, &c.

Charries.

Dukes, *Lukward*, *Bleeding-Hearts* White, Red, Black, *Flanders*, *Cluster*, white and black *Spanish*, *Amber*, *Black-Orleans*, *Naples*, *English*, *Carnation*, *Morella*, *Morocca*, *Egriot*, *Begarreaux*, *Portugal*, *Cologne*, *Prince*, *Kings*, *Crown*, *Purple*, *Ounce*, *Black*, *Dwarf* *Cherries*, &c.

Abricots.

Male, *Algier*, *Orange*, *Roman*, the *Common Abricot*.

Peaches.

Nutmeg, *Savoy*, *Newington*, *Troy*, *Isabella*, *Monsieur*, *Persian*, *Belline*, *Magdalen*, *Queen*, *Double-blossome*, *Rambouillet*, *Violet*, *Musc*, *Roman*, *Crown*, *Mau*, *Carnation*, *Portugal*, *Bordeaux*, *Quince*, *Des-pot*, *Pavie*, *Verona*, *Smyrna*, *Colerain*, *Bloody*, *Orleans*, *Navar*, *Morella*, *Alberges*: *NeGariner*, the red *Roman*, *Tawny*, *Murroy*, *Green*, *Cluster*, *White*, *Painted*, *Russet*, *Orbine*, *White paper NeGariner*; lastly *Malacottons*.

Plums.

Primordians, *Violet*, *Amber*, *Morocco*, *Damafne*, *Myrobalan*, *Abricot*, *Barbary*, *Kings*, *Imperial*, *Cinamon*, *Mogol*, *Tawny*, *Elizabeth*, *Pear-Plums* white and black, *Osterly*, *Muscle*, *Prunella*, *Catalonia*, *Bonum Magnum*, *Lawrence*, *Wheaten*, *Cheston*, *Queen-Mother*, *Bole*, *diapred*, *Damafco*, *Marbl'd*, *Foderingham Plum*, *Pedrigon*, *Verdock*, *Gaunt*, *Peach*, *Denny*, *Peasod*, *Turkie*, *Dater*, *Jane*, *Prince*, *Antony*, *Nutmeg*, *Damsons*, and *Bulls*.

Grapes.

Parfey, *Frontinias* white and red, *Muscadines*, small *Black*, or *Cluster-grape*, *Currant*, *Orleans*, *Raisin*, *Blue*, *Bursarobe*, *Burlet*, *Verjuice-grape*.

Figs.

Scio, *Blue*, *Dwarf*, *Purple*, *Yellow*.

Quinces.

Portugal apple and *pear Quinces*, *English*, *Barbary*, *Brunswic*, *Lions*, *Spanish*, &c.

Gooseberries.

Early Red, great *Yellow*, and *White*, *Dutch Gooseberrier*, *Blue*, *Crystalline*, *English* yellow; *Hedge-hog*, *Green*, *Rough Gooseberries*.

M m m

Corinths.

KALEDNARIUM HORTENSE.

Corinths.

English red, white, Dutch-red, great Red, Black, Currans.

Berberies.

The great Bar, without Stones, the ordinary Berb.

Rasberries.

The large Red, and White Garden-Rasb. the Wild-Rasb. black.

Mulberries.

The Black, or Red, the White, Virginian.

Strawberries.

Common Wood-Str. English Garden, American, Polonian, the great White Coped Str. Long-red, the green Strawb. &c.

Other Fruit.

Cornelians, Medlar Neapolitan, the great Dutch Med. the common English Med. and one without stones.

Services or Chequers, the Pear-forb.

Wallnuts, the Early-nut: The great double Wall, the Tender-Scul, the Hard shell, the Bird-nut.

Filbirds, or Avellans, the Red, White, the Constantinopolitan, the large Hazel-nut, the long thin-shell'd, the great round, &c.

FINIS.

ERRATA.

SYLVA.

Page 7. line 32. read unfermented, are (with a comma) p. 30. l. 16. r. is near twelve foot. l. 23. r. *Alnus*. p. 35. l. 44. r. *foliage*. p. 44. l. 8. r. days more. p. 49. l. 33. r. *Marden*. p. 55. l. 4. r. *latation*. p. 61. l. 36. r. and of *Tew*. p. 66. l. 39. r. unparallel'd. p. 69. l. 48. r. superannuated. p. 77. l. 47. r. flooped. p. 86. l. 19. r. *Figg*. p. 94. l. 32. r. other parts (so many years advanc'd.) p. 94. l. 20. *dile* to. p. 97. l. 6. r. reduc'd. p. 107. l. 21. r. in the cold. l. 37. r. that honourable. p. 111. l. 14. r. very good. p. 112. l. 38. r. lustrous. p. 117. l. 7. r. refifting Fire. p. 126. l. 13. (in the Contents of Cap. 25.) r. *Phillyrea*. l. 38. r. use of *Cork*. p. 127. l. *penult*. *Affulus*. p. 133. l. 20. r. in any spot. p. 144. l. 16. r. than small. p. 145. l. 1. r. *Panist*. l. 21. r. Tree. p. 149. l. 29. *dile* every. p. 151. l. 37. r. feverely. p. 162. l. 13. r. *gli tre castagn*. l. 45. r. spreads. p. 180. l. 22. Comma at *Calcuta*. p. 182. l. 5. r. 183. l. 31. r. smaller end, 23. only. p. 183. l. 14. r. First Column of the Fifth Table. p. 193. l. 24. r. Months. p. 195. l. 33. r. haply. *Lin. ult.* r. detruuding, for obruding. p. 197. l. 25. *Alis* all. p. 200. l. 16. r. finding. p. 201. l. 14. r. gives. p. 208. l. ult. r. laid bare. p. 209. l. 4. *dile* mas. l. 35. r. second to that. p. 210. l. 26. r. are not yet. p. 213. l. 40. r. interchange. p. 216. l. 1. r. Symptoms. p. 240. l. 26. *Amantitis*. l. 41. r. gentle. p. 253. l. 28. r. *Umbr*. p. 257. l. 5. r. ingenuous. p. 258. l. 4. r. *Sevius*. p. 262. l. 1. r. where it seems. p. 266. l. 23. r. and *Virgil*. *dele* and. p. 267. l. 24. r. They gave the day for lost. p. 269. l. 8. r. *Pseudo-Plantus*. p. 270. (in margin) r. *Salmajus*. p. 272. l. 27. r. *Extimplys*. p. 279. l. *autepenalt*. r. Odors. p. 281. first Column, r. *Phillyrea*.

Philes. Disc. of EARTH.

Page 317. line 21. read Mould, passim. p. 331. l. 28. transfer the Interrogation from *fall*, to *Air*.

Kalendar.

Page 30. l. 9. for promise, r. prove moderate.
These *Pravities* of the Printer, singular for plural, mistakes in Exotic Names, Misinterpunctations, and some othes Incongruities, the Civil Reader will easily Pardon.